CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

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Environmental Consequences
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4.1 INTRODUCTION

This chapter describes the environmental consequences, also referred to as “impacts” or “effects,” of implementing the alternatives described in Chapter 2 by presenting the likely direct, indirect, and cumulative impacts on resources, resource uses, special designations, and social and economic features. Each management action that is expected to impact a specific resource, resource use, special designation, or social or economic feature is analyzed. Where data are limited, professional judgment is used to predict environmental impacts. Professional judgment is based on observation, experience, analysis of conditions, and responses in similar areas.

The scope of the impact analysis presented in this chapter is commensurate with the level of detail of the actions presented in Chapter 2 and the availability and/or quality of data necessary to assess impacts. Current conditions in the planning area, as described in Chapter 3, serve as the baseline for characterizing impacts from the alternatives.

The impact analysis is designed to show relative differences in the alternatives as they pertain to specific resources, resource uses, special designations, and social and economic features and is not intended to predict the exact amount, timing, or location of effects that could occur should the alternative be selected for implementation.

Alternative VI (Proposed Resource Management Plan [RMP]) reflects changes or adjustments to the Preferred Alternative based on comments received on the Draft RMP/Environmental Impact Statement (EIS), new information or science, or changes in Bureau of Land Management (BLM) policies or priorities, and include objectives and actions described as portions of other analyzed alternatives.

4.1.1. How to Read this Chapter

Chapter Organization

Chapter 4 is organized into five general categories: *Tribal Rights and Interests, Resources, Resource Uses, Special Designations,* and *Social and Economic Features*. These categories are further subdivided by the sections identified in Chapter 2. Each section describes impacts to that specific resource, resource use, special designation, or social and economic feature, from management actions described in Chapter 2.

Each section discusses analysis methods, direct and indirect impacts, and cumulative impacts. Under the *Direct and Indirect Impacts* heading, the discussion is further divided into subsections that contain the impact analysis from management actions described in Chapter 2, organized by their Chapter 2 subject heading.

Analysis Methods

This subsection identifies the indicators and rationale for their selection, methods, and assumptions used in the analysis. The indicators are intended to be quantitative where possible, to allow for comparisons among alternatives. For example, many resources, resource uses, and special designations use impact indicators expressed in acres. The Chapter 2 sections for which management was analyzed in each Chapter 4 section were selected based on the likelihood for substantial impacts or because they were identified as planning issues through internal and external scoping. An explanation is also provided for the Chapter 2 sections that contain management that is not expected to result in any effects or change and, therefore, was not analyzed. Assumptions were developed based on the Jarbidge RMP Interdisciplinary Team knowledge of resources, resources uses, special designations, and social and economic features in the planning area. These assumptions should not be construed to confine or redefine management contained within alternatives and were used to allow a comparison of impacts resulting from the alternatives.

Acres used in the alternatives are approximate and serve for comparison and analytic purposes only. Data from geographic information systems have been used to develop acreage calculations and are

rounded to the nearest 1,000 acres, unless finer distinction is needed for comparison purposes. Readers should not infer that they reflect exact measurements or precise calculations.

Direct and Indirect Impacts

This subsection contains the environmental analysis for each section. It is organized by the Chapter 2 sections that contain management expected to impact the resource, resource use, special designation, or social and economic feature being analyzed. To avoid repetition, the analysis is framed in terms of impacts to the specific resource, resource use, special designation, or social and economic feature from management actions in Chapter 2. For example, the management actions in the *Water Resources* section of Chapter 2 are only discussed in terms of their effects on water resources. The impacts from management actions in the *Water Resources* section of Chapter 2 on other resources, resource uses, special designations, or social and economic features can be found in those sections (e.g., impacts of management actions for water resources on fish is found in the *Fish* section). The analysis is presented for each alternative.

The detailed analysis begins with the analysis of management actions specified in each alternative for the resource, resource use, special designation, or social and economic feature being addressed. For example, the *Impacts from Water Resources Actions* section addresses impacts to water quality and quantity from management actions specified under each alternative in the *Water Resources* section of Chapter 2. The analysis then addresses the effects on that resource, resource use, special designation, or social and economic feature from management in the Chapter 2 sections identified in the *Methods and Assumptions* subsection. For example, the *Water Resources* section addresses impacts to water resources from management actions in the *Upland Vegetation, Wildland Fire Ecology and Management, Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Areas of Critical Environmental Concern*, and *Wilderness Study Areas* sections of Chapter 2.

The impact analysis for resources focuses on impacts to that resource, while the impact analysis for resource uses focuses on the effects on opportunities to engage in the uses, not on that use's effects on the environment. For example, the impact analysis in the *Livestock Grazing* section analyzes the range of opportunities to graze livestock on public lands. Effects of livestock grazing on natural resources, such as vegetation and water quality, are addressed in the resource sections (e.g., *Vegetation Communities* and *Water Resources*). The impact analysis for special designations focuses on the impacts to the values for which they were designated. The analysis for social and economic features addresses effects or changes to the social setting and economic conditions in the planning area and region.

Following the detailed analysis, a summary of indirect and direct effects for each alternative is presented. Alternatives are contrasted and compared, and impacts and change are characterized with the impact intensities identified and discussed below.

Cumulative Impacts

This subsection contains the cumulative impact analysis for each section. It identifies the past, present, and reasonably foreseeable actions included in the analysis and then presents a summary of the cumulative impacts by alternative. The following past, present, and reasonably foreseeable actions are analyzed for cumulative impacts.

Population Growth

In south-central Idaho and northern Nevada, the population is expected to grow between 10% and 20% over the life of the plan, based on historical population growth rates. This growth will result in increased pressures on the environment. The increasing human population would increase activities in and adjacent to the planning area, resulting in an increased demand for recreation, travel, and land use authorizations. Cumulative impacts could include regional haze and air pollution from vehicle emissions, commercial and industrial operations, and increased human-caused fires.

Population growth cumulatively affects the following resources and social and economic feature. It is analyzed in those sections:

- Air Quality,
- Wildland Fire Ecology and Management, and
- Economic Conditions.

Military Use

Systematic military use in the planning area began in 1943 with the establishment of Mountain Home Air Force Base and the withdrawal of 420,000 acres in the planning area for use as an aerial bombing range. The base was briefly deactivated at the end of World War II, only to be reactivated in 1949. In 1963, the Saylor Creek Training Range was reduced to its present size of approximately 110,000 acres, and the remaining public lands reverted to management by the BLM. In 1998, an additional 12,000 acres in the planning area were withdrawn to create the Juniper Butte Training Range.

Livestock grazing occurs on Juniper Butte Training Range and is administered by the US Air Force (USAF). Slickspot peppergrass is located on the Juniper Butte Training Range and is exposed to the impacts of USAF administered grazing. The total acreage available for grazing is 11,453 acres. A three pasture system is used and is grazed for a maximum of 60 days within a 90-day period from April 15 to July 15. Several areas of the Juniper Butte Training Range are unavailable to grazing. These areas are the maintenance compound in the North Pasture (7 acres), slickspot peppergrass exclosures (172 acres), a grazing study area in the Southeast Pasture (29 acres), and exclosures in the Southwest Pasture (8 acres) used for collecting seed. Up to 1,328 animal unit months are authorized each year under this grazing lease.

The Saylor Creek and Juniper Butte Training Ranges are currently used by the USAF as well as the Idaho Air National Guard, naval aviation units from other bases in the western United States, and military training units from other countries. Live ordnance is no longer used at either range, the current and future impacts to soil resources and noxious weeds and invasive plants are related to use of routes in the planning area for transport of vehicles, equipment, and personnel to and from the ranges. The BLM also provides the military with wildland fire suppression assistance for wildland fires within the Saylor Creek and Juniper Butte Training Ranges under a cooperative agreement. In the event of multiple ignitions, wildland fire suppression priorities within the planning area could be modified to provide suppression assistance.

Military use cumulatively affects the following resources and special designation. It is analyzed in those sections:

- Soil Resources,
- Upland Vegetation,
- Wildlife,
- Special Status Plants,
- Special Status Wildlife,
- Noxious Weeds and Invasive Plants, and
- Wilderness.

Land Use Plans

The Bruneau Field Office is currently operating under the Bruneau Management Framework Plan from 1983. They will be preparing a RMP in the near future. The Burley Field Office is operating under the Cassia RMP from 1985, the Monument RMP from 1986, and the Twin Falls Management Framework Plan from 1982. They will be preparing a RMP in the near future. Idaho and Montana BLM published a Notice of Intent to prepare land use plan amendments to incorporate greater sage-grouse (sage-grouse) conservation measures. The direction in the land use plan amendments, expected to be finalized by the end of 2014, may reduce impacts to sage-grouse and their habitat.

Land use plans cumulatively affect the following resource and are analyzed in that section:

- Special Status Wildlife.

Water Resources

Consumptive and non-consumptive water uses have occurred since the turn of the 20th century and include livestock watering, crop irrigation, hydroelectric power generation, fish hatcheries, reservoirs, and other impounded waters for recreational and private irrigation water. These uses have placed increasing demand on surface water resources in and adjacent to the planning area. The result of the historic water resources uses is that, of the 316 miles of perennial stream in the planning area, 117 miles of stream in Idaho and 10 miles of stream in Nevada, are identified by Idaho Department of Environmental Quality and Nevada Division of Environmental Protection (NDEP) as water quality impaired and not fully supporting their designated beneficial uses. All of the perennial streams within the planning area contain either special status fish and aquatic invertebrate species (244 miles) or native non-game fish (72 miles). The allocation of surface water rights is managed by the Idaho Department of Water Resources and the NDEP. Surface water management by these State agencies has direct, indirect, and cumulative impacts to instream, riparian and water quality and quantity on BLM-managed streams, but is not under BLM control.

Streamflow alteration occurs on numerous streams in the planning area and includes diversions for cropland irrigation on private land and large hydroelectric facilities on the Snake River. Consequently, redband trout habitat has been fragmented into isolated stream reaches on Federal, State, and private land in and adjacent to the planning area. The impacts of diverting surface flows and dewatering of streams that drain into special status fish and aquatic invertebrate species habitats are expected to increase as the demand for surface and groundwater resources for consumptive and non-consumptive uses continue in the future. Streamflow alterations in the Snake River have similar effects to Snake River white sturgeon and Snake River snails and their habitats.

Water resource actions cumulatively affect the following resource and are analyzed in that section:

- Special Status Fish and Aquatic Invertebrates.

Upland Vegetation

Public lands in and adjacent to the planning area have been treated in the past to reduce the amount of sagebrush through chaining, railing, herbicides, and plow-and-seed projects to increase forage for livestock. Treatments in the Burley and Shoshone Field Offices have reduced acreages of annual communities and established primarily native grassland and non-native perennial communities. Vegetation treatments, including seeding grasses and removal of sagebrush by burning, herbicides, or mechanical means for forage production, have also occurred on State and private lands in and adjacent to the planning area. Some vegetation treatments will continue on adjoining BLM and Forest Service lands to address juniper encroachment, to rejuvenate aspen, or to achieve other objectives. Vegetation treatments to reduce sagebrush and maintain or increase forage for livestock would continue on private rangeland.

Vegetation treatments of annual or other vegetation communities for fuels reduction and native shrubland restoration, including prescribed fire, seeding of perennial vegetation, or planting shrubs, are expected to occur on adjacent Federal lands. These treatments would occur as they have in the past, both reactively following wildland fire and as proactive treatments. Vegetation treatments, including seeding grasses and removal of sagebrush by burning, herbicides, or mechanical means for forage production, are expected to continue to occur on State and private lands in and adjacent to the planning area.

Upland vegetation management actions cumulatively affect the following resources and are analyzed in those sections:

- Climate Change,
- Upland Vegetation,
- Wildlife, and
- Special Status Wildlife.

Riparian Areas and Wetlands

Riparian areas and wetlands are focus areas for many uses and, as a result, have been locally degraded over time. Factors contributing to current riparian condition include livestock grazing, recreational uses, road construction and use, wildland fire and wildland fire suppression, increases in the amount of noxious weeds and invasive plants, and the diversion of surface water. All of these factors have reduced habitat condition ratings over time and are expected to continue to influence riparian condition in the future. Activities on Federal, State, and private land will continue to influence habitat condition and proper functioning condition ratings on public land. As human population increases over time, the use of surface and groundwater water that support riparian areas is expected to increase.

Riparian area and wetland management actions cumulatively affect the following resource and are analyzed in that section:

- Special Status Fish and Aquatic Invertebrates.

Noxious Weeds and Invasive Plants

Noxious weeds and invasive plants are expected to spread to the planning area from other locations through motorized vehicles, wind, water, disturbance corridors (such as roads, trails, livestock driveways, and fuel breaks), livestock, humans, and wildlife. While State laws mandate treatment of noxious weeds on all Federal, State, and private lands, past levels of treatment have been inadequate for control or eradication. Untreated Federal, State, and private lands have been a seed source for noxious weeds and invasive plants.

Noxious weeds and invasive plants will continue to be spread to and from public lands by vehicles, wind, water, disturbance corridors, livestock grazing, and, to a lesser extent, wildlife. Untreated populations of noxious weeds on Federal, State, and private lands will continue to be a seed source of noxious weeds and invasive plants.

Noxious weed and invasive plant management actions cumulatively affect the following resources and are analyzed in those sections:

- Upland Vegetation,
- Riparian Areas and Wetlands,
- Fish,
- Special Status Fish and Aquatic Invertebrates, and
- Wildland Fire Ecology and Management.

Wildland Fire Ecology and Management

In the past two decades, the frequency of wildland fires has increased. Since 1987, more than three million acres of public land have burned in the area comprised by the Jarbidge, Burley, Bruneau, Shoshone, and Wells (NV) Field Offices; the Snake River Birds of Prey National Conservation Area; the South Hills Unit of the Sawtooth National Forest; and the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest. Other Federal, State, and private lands have also burned during this period. Of the total, about 23% of acres have burned more than once and 5% have burned three or more times. The origin of these wildland fires includes human-caused and natural ignitions that occur on Federal, State, and private lands and frequently cross ownership boundaries as the fire progresses.

These wildland fires resulted in the conversion of more than 1,500,000 acres of sagebrush-steppe to grassland. Continued large wildland fire will further reduce and fragment sagebrush steppe and reduce or eliminate habitat connectivity for some wildlife species.

The Jarbidge Field Office is preparing an environmental assessment to consider the impact of strategically installing and maintaining a series of fuels breaks. Maintenance of fuel breaks may be accomplished through mowing, burning or other methods. The Burley Field Office completed several fuels treatments to reduce juniper in an area south of Oakley. Those treatments are expected to continue. The Bruneau Field Office is in the preliminary stages of drafting a fuel break environmental assessment.

The increased occurrence of noxious weeds and invasive plants provides finer fuels that more readily burn than native perennial vegetation. Increased human access due to increases in motorized recreation use in remote areas poses an increased risk for wildland fire starts in uplands and riparian areas. The occurrence and frequency of wildland fires and the need for wildland fire suppression and fuels treatments to reduce wildland fire severity are expected to increase over the life of the plan.

As the incidence of wildland fire increases, the need for suppression activities also increases. Actions to suppress wildland fires, such as retardant drops, diverting surface flows, and back-burning to reduce fuels and slow the progression of wildland fires, all can influence water quality, water quantity, and riparian condition.

Wildland fire ecology and management actions cumulatively affect the following resources, resource uses, and special designation and are analyzed in those sections:

- Air Quality,
- Soil Resources,
- Water Resources,
- Upland Vegetation,
- Riparian Areas and Wetlands,
- Fish,
- Wildlife,
- Special Status Plants,
- Special Status Fish and Aquatic Invertebrates,
- Special Status Wildlife,
- Noxious Weeds and Invasive Plants,
- Wildland Fire Ecology and Management,
- Cultural Resources,
- Livestock Grazing,
- Transportation and Travel, and
- Wilderness.

Livestock Grazing

Prior to 1934, livestock grazing on Federal lands was unregulated. The Taylor Grazing Act established a permit system and authorized the development of allotment fences and water systems. Unrestricted livestock grazing has been attributed as a causative factor in the introduction and spread of invasive plants, including cheatgrass (Billings, 1994). Until the passage of the National Environmental Policy Act of 1969 (NEPA), impacts of livestock grazing use and development of livestock-related facilities were not required to be methodically analyzed. Adjacent BLM and Forest Service lands beyond the planning area share a similar history.

Livestock grazing will continue on Federal, State, and private lands over the life of the plan. Livestock grazing is anticipated to be the major economic driver within the planning area and surrounding communities. Livestock numbers are expected to remain stable or slightly increase on State and private lands. State grazing lands, managed by the Idaho Department of Lands and the Nevada Division of State Lands, and private lands are subject to State law requiring control of noxious weeds. State law does not extend to control of invasive plants. State grazing lands and private lands are generally not subject to laws or regulations that require consideration and protection of cultural resources.

Livestock grazing management actions cumulatively affect the following resources, resource uses, and social and economic features and are analyzed in those sections:

- Climate Change,
- Soil Resources,
- Water Resources,
- Upland Vegetation,

- Riparian Areas and Wetlands,
- Fish,
- Wildlife,
- Special Status Plants,
- Special Status Fish and Aquatic Invertebrates,
- Special Status Wildlife,
- Noxious Weeds and Invasive Plants,
- Cultural Resources, and
- Social Conditions.

Recreation

Dispersed recreation activities including all-terrain vehicle (ATV), utility task vehicle (UTV), and off-road motorcycle riding; hunting; fishing; camping; driving for pleasure; and boating have been popular in the planning area for decades. There have been a limited number of whitewater recreators on the Snake River and lower Jarbidge and Bruneau Rivers. Murphy Hot Springs, Indian Hot Springs, and other geothermal springs in the lower Bruneau Canyon have also been used by recreators. Over the last 10 years, recreational use has increased as a result of the technological advancements in transportation, especially the development of ATVs, UTVs, and off-road motorcycles. As local populations increased and these vehicles became increasingly available to the general public, the number of recreators using BLM-managed lands also increased. Access routes related to range and right-of-way (ROW) developments and motorized recreation have increased substantially over the last 20 years. Recreators began to pursue more remote locations for outdoor recreational experiences. With population growth in the region, outdoor recreation use of the public lands is expected to increase. Such an increase would likely lead to heavier use of existing sites as well as the spread of dispersed use into less heavily used areas.

Areas with concentrated recreation use that do not have focused recreation management would experience degradation to natural resources (e.g., soil, vegetation, water quality) and conflicts with resource uses as demand increases and recreation technology changes. Changes in technology could result in new forms of recreation that are not in existence today and may evolve into major recreation issues over the life of the plan. Use of new recreation technology would need to be consistent with management for Special Recreation Management Areas in those areas.

Recreation management actions cumulatively affect tribal rights and interests, the following resources, resource uses, special designation, and social and economic feature and are analyzed in those sections:

- Water Resources,
- Special Status Fish and Aquatic Invertebrates,
- Cultural Resources,
- Recreation,
- Wilderness, and
- Social Conditions.

Transportation and Travel

Access routes related to range and ROW developments and motorized recreation have increased substantially over the last 20 years. Recently revised travel management plans on adjacent or nearby Federal lands are restricting motorized travel to address a variety of resource concerns. In the Owyhee County portion of the planning area, the Omnibus Public Lands Management Act of 2009 (OPLMA) changed all areas open to cross-country motorized use to limited to existing routes until a transportation plan is completed.

The changes in travel management on nearby Federal lands coupled with an increasing human population are expected to result in more travel uses in the planning area over time. Motorized recreational use is expected to be a large component of the expected increased travel use. Travel within the planning area related to permitted or authorized uses as well as for recreational purposes are expected to increase as public land users pursue a variety of uses and activities. The demand for access

to BLM-managed lands is expected to continue to pose a risk to water quality in riparian areas and wetlands in the future.

Transportation and travel management actions cumulatively affect tribal rights and interests, as well as the following resources, resource uses, special designation, and social and economic feature and are analyzed in those sections:

- Soil Resources,
- Water Resources,
- Upland Vegetation,
- Riparian Areas and Wetlands,
- Fish,
- Wildlife,
- Special Status Plants,
- Special Status Fish and Aquatic Invertebrates,
- Special Status Wildlife,
- Noxious Weeds and Invasive Plants,
- Paleontological Resources,
- Recreation,
- Transportation and Travel,
- Wilderness, and
- Social Conditions.

Land Use Authorizations

Land use authorizations include a wide variety of public land uses granted under a ROW, lease, or permit. Historically, there were relatively few ROWs in the planning area, but over time the number has increased on BLM-managed land as well as on State and private lands. These include a variety of relatively small-scale uses such as ROWs for roads or powerlines to private residences, pipelines, ditches, canals, and irrigation diversions. ROWs for large-scale land uses include high-voltage transmission lines, power substations, communication sites, irrigation water pumping stations, and airstrips. Current proposals include Gateway West (a high-voltage transmission line in the northern part of the planning area), Mountain States Transmission Intertie (a high-voltage transmission line north of the planning area), Southwest Intertie Project (a high-voltage transmission line east of the planning area), and a hydroelectric facility at Corral Creek.

Existing developments in the planning area include the Northwest Pipeline and Chevron natural gas pipelines and numerous large and small Idaho Power transmission lines. Past utility-related authorizations, particularly transmission lines, have affected soil and upland vegetation resources in the northern portion of the planning area.

Wind energy development is increasing in the planning area. Nine wind farms are currently operating on private land in the northeast portion of the planning area. Two more are proposed: China Mountain Wind Energy Project and Vertical Energy Wind Energy Project. China Mountain wind energy project would place between 160 and190 turbines on BLM and private land around the China Mountain area in the southeastern portion of the planning area and northern Nevada. Vertical Energy is a proposed small wind energy project located in the northern part of the planning area west of the existing wind farms in the Bell Rapids area. The project would place turbines on private land and potentially three to four turbines on BLM-managed land.

Numerous wind energy projects have been developed or proposed adjacent to the planning area on both private and BLM-managed lands. There are eight wind farms in the Hammett area, two near Hagerman, one southeast of Twin Falls, and three southwest of Burley. Three projects are proposed east of Burley, four in the Rogerson area, one north of Jerome, and three in the Murphy area. However, it is speculative to assume all eight will be constructed.

Several solar energy projects are being developed or have been proposed adjacent to the planning area on private land in the Grandview area in Elmore County and in Jerome County. No solar energy projects have been proposed or developed in the planning area.

Land use authorizations cumulatively affect tribal rights and interests as well as the following resources, resource uses, and special designation and are analyzed in those sections:

- Air Quality,
- Soil Resources,
- Water Resources,
- Riparian Areas and Wetlands,
- Fish,
- Wildlife,
- Special Status Fish and Aquatic Invertebrates,
- Special Status Wildlife,
- Noxious Weeds and Invasive Plants,
- Wild Horses,
- Paleontological Resources,
- Cultural Resources,
- Livestock Grazing,
- Recreation,
- Transportation and Travel,
- Land Use Authorizations, and
- National Historic Trails.

Land Tenure

Planning documents for BLM-managed lands adjacent to the planning area identify lands that remain available for a variety of land tenure transactions, including sale, exchange, and Recreation and Public Purposes Act of 1954 lease.

Land tenure management actions cumulatively affect the following resource and resource use and are analyzed in those sections:

- Air Quality and
- Land Tenure.

Minerals

A total of 251 oil and gas leases have been issued in the past in the planning area, although only three wells have ever been drilled (in the 1950s, all were dry), and no Federal mineral estate in the planning area is currently under lease. Recently, there has been renewed interest in oil and gas leasing. In 2008, a request to offer parcels in the planning area for oil and gas leasing was filed for approximately 58,000 acres in the southeast corner of the planning area. Fluid leasable minerals are a national priority for energy development and are expected to continue to be in demand for future leasing and development. While the likelihood is low, if oil and gas or geothermal resources of producible quantity are identified, additional demands on surface or groundwater resources can be expected.

Salable minerals such as gravel and decorative rock have historically been and are currently obtained from several approved sites on the public land. Additional gravel and decorative rock sites are also located on State and private land, which have been and will continue to be used in conjunction with public land activities. Public demands for salable minerals are expected to increase in the future.

Historically, locatable mineral exploration and development occurred in the Jarbidge River Watershed and in portions of the Snake River. There is currently one active mining claim in the planning area for Bruneau jasper and 12 active claims for gold. Public demand for locatable minerals is expected to increase in the

future, although demand in the planning area itself is not likely to increase due to its low potential for occurrence of commercially viable deposits of locatable minerals.

Planning decisions made for lands in and adjacent to the planning area affect future mineral exploration and development.

Minerals management actions cumulatively affect the following resources and resource uses and are analyzed in those sections:

- Water Resources,
- Riparian Areas and Wetlands,
- Fish,
- Special Status Fish and Aquatic Invertebrates,
- Special Status Wildlife,
- Paleontological Resources,
- Leasable Minerals,
- Salable Minerals, and
- Locatable Minerals.

Wild and Scenic Rivers

OPLMA designated four Wild and Scenic River (WSR) segments in the planning area: a 38.1-mile segment of the Bruneau River as a wild river, a 0.5-mile segment of the Bruneau River as a recreational river, a 0.3-mile segment of the West Fork of the Bruneau River as a wild river, and a 27.9-mile segment of the Jarbidge River as a wild river.

In the planning area, two river segments totaling 23 miles are suitable and 11 river segments totaling 110 miles are eligible for inclusion in the Wild and Scenic River System.

WSR management actions cumulatively affect the following social and economic feature and are analyzed in that section:

- Economic Conditions.

Wilderness Characteristics

OPLMA designated 89,780 acres as the Bruneau-Jarbidge Rivers Wilderness of this 60,320 acres are in the planning area. The remaining acres are outside the planning area within the Bruneau Field Office. Of the acres within the planning area, 46,170 acres were formerly in the Jarbidge River Wilderness Study Area (WSA), 13,980 acres were formerly in the Bruneau River-Sheep Creek WSA, and 170 acres were not in either WSA.

OPLMA designated four other wilderness areas in the Bruneau Field Office: Big Jacks Wilderness (53,000 acres), Little Jacks Creek Wilderness (51,000 acres), Owyhee River Wilderness (72,000 acres), and Pole Creek Wilderness (13,000 acres). Within the Humboldt-Toiyabe National Forest, the Jarbidge Wilderness (160,000 acres) has been managed for its wilderness values since it was designated in 1964.

There is currently one WSA in the planning area. The Lower Salmon Falls Creek WSA is located in both the Jarbidge and Burley Field Offices, and includes 2,000 acres of BLM-managed land in the planning area.

Adjacent to the planning area, the Burley Field Office has two WSAs (including the Lower Salmon Falls Creek WSA) totaling 2,000 acres, the Four Rivers Field Office has two WSAs totaling 25,000 acres, and the Shoshone Field Office has 17 WSAs totaling 632,000 acres.

Both the BLM and Forest Service have inventoried Federally managed lands within and adjacent to the planning area for wilderness characteristics per the Wilderness Act of 1964, with varying levels of management guiding resources and uses that occur on these lands. Within the planning area, 18 areas were identified as Lands with Wilderness Characteristics (110,000 acres). Within the Humboldt-Toiyabe

National Forest, three Inventoried Roadless Areas (19,000 acres) were identified in 1984 and are managed for roadless values.

Wilderness characteristics management actions cumulatively affect the following resource and special designation and are analyzed in those sections:

- Lands with Wilderness Characteristics and
- Wilderness Study Areas.

Assumptions

Several general assumptions were made to facilitate analysis of impacts. The assumptions listed below are common to all resources, resource uses, special designations, or social and economic features. Other assumptions specific to particular resources, resource uses, special designations, or social and economic features are identified in those sections.

- The decisions of the RMP apply only to public lands managed by the BLM, including private lands with Federal mineral estate. They do not apply to inholdings or adjacent State, private, or other lands. Livestock grazing decisions apply to the Saylor Creek Training Range outside the Exclusive Use Area.
- The BLM will have the funding and workforce to implement the selected alternative.
- All decisions and components of an alternative would be implemented as described in Chapter 2.
- The plan would be implemented over the next 15 to 20 years.
- Implementation of actions from any alternative would be in compliance with all valid existing rights, Federal regulations, BLM policies, and other requirements.
- Specific actions to be implemented under the direction of the RMP would be analyzed through the National Environmental Policy Act of 1969 (NEPA) process, except for the issuance of leases for fluid minerals such as oil, gas, and geothermal resources. The Jarbidge RMP/EIS constitutes the NEPA evaluation of fluid mineral leasing in the planning area.
- Because acreages were calculated using geographic information system technology and rounded, total acreage figures may vary slightly between sections. These variations are negligible and do not affect the analysis.
- Acreage figures and other numbers used in the analyses are approximate projections for comparison and analytic purposes only. Readers should not infer they reflect exact measurements or precise calculations.
- The discussion of impacts is based on the best available data. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, were used to infer environmental impacts where data are limited.
- Climatic patterns observed within the planning area over the past 50 years will continue over the life of the plan.
- Population in the Magic Valley and surrounding areas will continue to increase.
- Demand for recreational activities (both dispersed and concentrated), energy development, salable minerals, vegetation resources, and wildlife use (non-consumptive and consumptive) will increase in the planning area over time.
- Demand for leasable minerals in the planning area is not likely to change from the present as described in the Reasonably Foreseeable Development Scenarios (Appendices K and L).
- Demand for locatable minerals in the planning area is not likely to change from present.
- Demand for salable minerals in the planning area is expected to continue to be high, and once salable minerals in existing pits are exhausted, additional pits would be developed. There are currently 1,300 acres within the planning area being used for salable mineral operations of all types. Based on the anticipated demand in the No Action Alternative and Alternatives I, IV, V, and VI, new pits are not expected to exceed a total of 1,000 acres; even with the higher anticipated demand in Alternatives II and III, new pits are not expected to exceed a total of 2,000 acres under those scenarios.
- In areas where land use authorizations and mineral development is likely to occur, potential or expected development areas were defined. These areas were developed by taking into account

areas with the physical or geologic characteristics (e.g., wind or mineral potential) and the allocations in Chapter 2 necessary for development. Further discussion on how these areas were created can be found in the *Land Use Authorizations* and *Minerals* sections.

Impact Terminology

Consistent terminology for characterizing impacts is used in this chapter. Qualifying terms referring to the intensity, scope (spatial extent), and duration of impacts will be used. Using the impact indicators as the primary criteria to determine whether beneficial or adverse impacts are predicted, the following terminology is used to characterize impacts.

Impact Types

Direct impacts – Direct impacts occur at the same time and location where a management action or set of management actions take place.

Indirect impacts – Indirect impacts occur later in time or in a different location as a management action or set of management actions, but are still reasonably foreseeable. Indirect effects may include effects related to changes in the pattern of land use, population density, or related effects on air and water and other natural systems, including ecosystems.

Cumulative impacts – Cumulative impacts are impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes those other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time.

Impact Categories

Adverse – Adverse effects to a resource are those that result in a decrease in the amount, extent, or quality of the resource. Adverse effects to a resource use are those that result in a decrease in the opportunity to engage in the use, either through a reduction in the area available for that use or an increase in the amount of restrictions on that use. Adverse effects to a special designation are those that result in a decrease in the amount, extent, or quality of the values for which the area was designated. Adverse effects to social and economic features result in a decrease in social and economic opportunities. It is important to note, the term “adverse” has a specific legal context with regard to the Endangered Species Act of 1973 (ESA) and the regulations for the National Historic Preservation Act of 1966 (NHPA; 36 Code of Federal Regulations [CFR] 800) that is typically used when discussing site-specific projects. The use of the term “adverse” in the Jarbidge RMP/EIS is not synonymous with the definition for either ESA or NHPA.

Beneficial – Beneficial effects to a resource are those that result in an increase in the amount, extent, or quality of the resource. Beneficial effects to a resource use are those that result in an increase in the opportunity to engage in the use, either through an increase in the area available for that use or a decrease in the amount of restrictions on that use. Beneficial effects to a special designation are those that result in an increase in the amount, extent, or quality of the values for which the area was designated. Beneficial effects to social and economic features result in an increase in social and economic opportunities. Beneficial impacts are also qualified by how well they meet the resource goals and objectives.

Impact Intensity

The general guidelines used for establishing impact intensities are provided below:

Minor – The effect is slight but detectable; there would be a small change (e.g., the impact to air quality from particulate matter generated by a prescribed fire as a vegetation treatment).

Moderate – The effect is readily apparent; there would be noticeable change (e.g., the impacts tribal rights and interests from Visual Resource Management).

Major – The effect is large and highly noticeable (e.g., reducing route density throughout the majority of the planning area is expected to have a major beneficial impact to special status fish and aquatic invertebrates).

Each impact intensity level described above is not necessarily used in every analysis. Impacts to some resources, resource uses, special designations, and social and economic features do not need, or lend themselves to, all three levels of intensity definitions.

Spatial Extent

Where possible, impacts are characterized by a number of acres and general locations for where the impacts would occur. However, some analyses are more qualitative; for those situations, the following descriptors for the spatial extent of the impacts are used:

Localized – The effect occurs at a specific site or within a relatively small area (e.g., within a specific area in a Vegetation Management Area [VMA]).

Extensive – The effect occurs within a larger area, but not throughout the entire planning area (e.g., within an entire VMA).

Area-wide – The effect occurs throughout all or most of the planning area (e.g., across multiple VMAs). This could include an effect to the majority of acres within the planning area or to a smaller number of acres scattered throughout the planning area.

Temporal Extent

Short-term – The effect occurs for a short time after implementation of a management action. The effective time period is five years or less.

Long-term – The effect occurs for an extended period after implementation of a management action. The effective time period is greater than five years.

4.1.2 Incomplete or Unavailable Information

The Council on Environmental Quality (CEQ) established implementation regulations for NEPA requiring that a Federal agency identify relevant information that may be incomplete or unavailable for an evaluation of reasonably foreseeable significant adverse effects in an EIS (40 CFR 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an EIS. Knowledge and information is, and would always be, incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the Jarbidge RMP/EIS. Considerable effort was taken to acquire and convert resource data into the most useful format for the analyses conducted. This information came from the BLM and outside sources.

The following types of data were incomplete for the entire planning area:

- Field inventory of special status plants occurrence,
- Field inventory of road and trail use,
- Field inventory of properly functioning condition assessments of riparian areas and wetlands, and
- Field inventory of streams for fish habitat condition.

For these resources, estimates were made regarding the number, type, and significance, based on previous surveys and existing knowledge. Additionally, some impacts cannot be quantified, given the proposed management actions. Where this gap occurs, impacts are projected in qualitative terms. In many situations, subsequent project-level analysis will provide the opportunity to collect and examine the site-specific inventory data required to determine appropriate application of RMP-level management. In addition, ongoing inventory efforts by the BLM and other agencies within the planning area continue to update and refine information that will be used to implement this Proposed RMP.

4.1.3 Mitigation

Mitigation measures designed to avoid or reduce impacts are incorporated into the management actions of each alternative, as defined in Chapter 2. There are no separate or additional mitigation measures beyond the actions outlined in the alternatives; therefore, impacts identified in this chapter are unavoidable and would result from implementing the alternatives.

4.1.4 Irreversible and Irretrievable Impacts

Section 1502.16 of the CEQ regulations requires the discussion of environmental consequences to include a description of "…any irreversible or irretrievable commitment of resources which would be involved in the proposal should it be implemented." Irreversible is a term that describes the loss of future options. It applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long periods of time. For example, extraction and processing of sand and gravel as part of an aggregate mining operation is considered an irreversible commitment of salable minerals because once the minerals are extracted and processed, they cannot be renewed within a reasonable timeframe.

An irretrievable commitment of resources refers to decisions resulting in the loss of production, harvest, or use of a resource. For example, a decision not to treat woodlands encroaching into adjacent grassland habitat results in the irretrievable loss of forage production from the grassland community. The forage production lost is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume forage production.

The decision to select one of the seven alternatives described in this Final EIS does not constitute an irreversible or irretrievable commitment of resources because the decision does not authorize any on-the-ground activities. Instead, decisions made in an approved RMP serve to guide future actions and subsequent site-specific decisions. Following the signing of the Record of Decision for the RMP, subsequent implementation plans (e.g., activity- or project-specific plans) will be proposed and implemented by the BLM. Implementation requires appropriate project-specific planning, NEPA analysis, and the BLM's final approval authorizing on-the-ground activities to proceed.

4.2. TRIBAL RIGHTS AND INTERESTS

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to tribal rights and interests:

- **Conditions of natural resources used by the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes for food, medicine, or ceremony –** Native plants and animals figure prominently in tribal subsistence economies and traditional medical and spiritual practice.
- **The physical integrity and setting of places having religious and cultural importance to the tribes –** Many aboriginal archaeological sites, traditional cultural properties, and sacred and ceremonial sites, especially those recalled in oral histories, are important in contemporary tribal culture for the tangible connection they provide to tribal history and ancestral lifeways.
- **Accessibility of BLM-managed lands for the exercise of treaty rights or tribal interests –** Off-reservation rights and interests are generally tied to Federally managed lands. Management actions that affect the quantity, quality, or access to these lands also affect tribal rights and interests.

Methods and Assumptions

The purpose of this analysis is to ensure tribal rights and interests, as reflected in the indicators above, are adequately represented and considered in the development of the Jarbidge RMP. To that end, the BLM has sought and obtained input from the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes, through government-to-government consultation, on public land management issues of importance to the tribes.

Impacts to tribal rights and interests are difficult to quantify with precision because the management actions under consideration do not identify specific projects or exact locations where impacts may occur. In addition, tribal members are often reluctant to divulge sensitive information concerning places of religious and cultural importance for fear that exposure would result in impacts to the sanctity of such sites. Nevertheless, sufficient information is available on the types of public land resources used by the tribes, and the potential effects of BLM authorized actions on those resources, to evaluate the impacts of the alternatives on tribal rights and interests at the landscape scale of reference.

For this analysis, the footprint of allocations and management actions expected to impact tribal rights and interests were compared to the public land base in the planning area. The impacts to resources important to the tribes in turn impact tribal rights and interests. For that reason, impacts identified in the summary of direct and indirect impacts for each of the following sections was used to analyze impacts to tribal rights and interests instead of the specific management actions contained in those sections:

- Upland Vegetation;
- Fish and Wildlife, including Special Status Species; and
- Cultural Resources.

Management contained in the *Tribal Rights and Interests*, *Visual Resources,* and *Land Tenure* sections was analyzed in detail as it would have direct and indirect impacts to tribal rights and interests. Management contained in the *Water Resources*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Recreation*, *Transportation and Travel*, and *Land Use Authorizations* were not analyzed in detail because the effects are captured in the analyses for the sections identified above. Management in the remaining sections is not anticipated to impact resources of importance to the tribes.

The following assumptions were used when analyzing impacts to tribal rights and interests:

- Government-to-government consultation during implementation level planning would identify and address potential impacts to tribal rights and interests at the project level.

- The methods, assumptions, and results of the analyses contained in the *Upland Vegetation, Fish and Wildlife, Special Status Species, Cultural Resources, Visual Resources,* and *Land Tenure* sections are adequate and appropriate for use in the analysis of impacts to tribal rights and interests.
- Management actions that maintain or enhance native vegetation and fish and wildlife habitat would protect tribal rights and interests attached to those resources, while actions that degrade or reduce native vegetation or fish and wildlife habitat would diminish tribal rights and interests.
- Management actions that restrict surface development and disturbance generally protect natural and cultural resources associated with tribal rights and interests.

Direct and Indirect Impacts

Impacts from Tribal Rights and Interests Actions

The following indicators were used to analyze the impacts of Tribal Rights and Interests actions on tribal rights and interests:

- Conditions of natural resources used by the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes for food, medicine, or ceremony;
- The physical integrity and setting of places having religious and cultural importance to the tribes; and
- Accessibility of BLM-managed lands for the exercise of treaty rights or tribal interests.

In the discussions below, the terms adverse, beneficial, minor, moderate, and major are used as defined under *Impact Categories* and *Impact Intensity* in the *Introduction* to this chapter.

Impacts from Management Specific to the No Action Alternative

The 1987 Jarbidge RMP provides no management actions, goals, or objectives specific to tribal rights and interests. Current laws, regulations, and policies would be followed to maintain the condition, integrity, and accessibility of natural and cultural resources of importance to the tribes.

Impacts from Management Common to All Action Alternatives

Tribal rights and interests would be maintained through government-to-government consultation, consideration of the effects of BLM decisions on resources of importance to the tribes during project planning, protection of the physical integrity of sacred sites and continued tribal access to them, and collaborative management of traditional cultural properties. The action alternatives make the BLM's obligations to the tribes explicit and add an educational component to increase understanding and appreciation of tribal rights and interests related to public land management. Although precise measurement is not possible, the action alternatives are expected to improve the BLM's ability to address tribal concerns with the condition, integrity, and accessibility of natural and cultural resources.

Impacts to Tribal Rights and Interests Relative to Upland Vegetation

The following indicator was used to analyze the impacts of Upland Vegetation actions on tribal rights and interests:

- Conditions of natural resources used by the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes for food, medicine, or ceremony.

The desired acreage or percent composition of native vegetation (i.e., native grassland and native shrubland communities) and non-native vegetation (i.e., annual, non-native perennial, and non-native understory communities) vary by alternative and would be attained through a variety of treatments and use allocations. Native plant communities provide traditional foods and medicinal plants as well as habitat for large and small game animals of importance to the tribes. Alternatives that benefit native grasslands and shrub communities would maintain or improve the condition of tribally important plant and animal resources. Non-native plant communities, including annual grasslands, often out-compete native plants and reduce available habitat for tribally important plants and wildlife. The analysis of upland vegetation communities examines the effects of noxious weeds and invasive plants, wildland fire, livestock grazing,

and transportation and travel on native plants. The *Vegetation Communities* section of this chapter contains details concerning the specific indicators, methods, and assumptions used in the analysis.

Native vegetation communities have declined dramatically in southern Idaho since the late 1800s, due in large part to agricultural development; the establishment of cities, towns, and suburbs and their supporting transportation systems; and the effects of wildland fire, noxious weeds, and invasive plants. Livestock grazing has also played a role. In past decades, brush control projects were conducted and non-native seedings were established on public lands to bolster grazing capacity.

Impacts from Changes to Upland Vegetation in the No Action Alternative

Based on the analysis of impacts to vegetation communities, the No Action Alternative would result in the most acreage dominated by invasive annual vegetation and the lowest acreage of native shrubland communities of all the alternatives. This would result in the greatest reduction in habitat for plants and animals of importance to the tribes.

Impacts from Changes to Upland Vegetation in Alternative I

Alternative I would reduce the acreage of annual communities in comparison to the No Action Alternative and Alternative V, but would result in higher levels of annual communities than Alternatives II, III, IV, and VI. Annual communities provide poor habitat for plants and animals of importance to the tribes. The acreage of shrubland communities, which provides favorable habitat for tribally important plants and animals, would be higher under this alternative than under the No Action Alternative and Alternatives II, III, and V, but lower than Alternatives IV and VI.

Impacts from Changes to Upland Vegetation in Alternative II

Alternative II would result in lower acreages of annual communities than the No Action Alternative and Alternatives I, III, V, and VI, but would also result in lower acreages of shrubland communities than all but the No Action Alternative. Much of the annual community acreage would be converted to non-native perennial grassland communities, which reduces habitat for plants and animals of importance to the tribes.

Impacts from Changes to Upland Vegetation in Alternative III

Alternative III would reduce the acreage of annual communities in comparison to the No Action Alternative and Alternatives I, V, and VI, but would result in higher levels of annual communities than Alternatives II and IV. Annual communities provide poor habitat for plants and animals of importance to the tribes. The acreage of shrubland communities, which provides favorable habitat for tribally important plants and animals, would be higher under this alternative than the No Action Alternative and Alternative II, but lower than Alternatives I, IV, V, and VI.

Impacts from Changes to Upland Vegetation in Alternative IV

Alternative IV would result in the lowest acreage of annual communities and the highest acreage of shrubland communities of all the alternatives. Management actions under Alternative IV would provide the largest amount of habitat for plants and animals of importance to the tribes.

Impacts from Changes to Upland Vegetation in Alternative V

Alternative V would reduce the acreage of annual communities in comparison to the No Action Alternative, but would result in higher levels of annual communities than Alternatives I, II, III, IV, and VI due to reduced levels of active restoration. Annual communities provide poor habitat for plants and animals of importance to the tribes. The acreage of shrubland communities, which provides favorable habitat for tribally important plants and animals, would be higher under this alternative than the No Action Alternative and Alternatives II and III, but lower than Alternatives I, IV, and VI.

Impacts from Changes to Upland Vegetation in Alternative VI (Proposed RMP)

Alternative VI would reduce the acreage of annual communities in comparison to the No Action Alternative and Alternatives I and V but would result in higher levels of annual communities than Alternatives II, III, and IV. Even so, Alternative VI would reduce annual communities by more than half compared to current baseline conditions. Annual communities provide poor habitat for plants and animals

of importance to the tribes. The acreage of shrubland communities, which provides favorable habitat for tribally important plants and animals, would be substantially higher under this alternative than the No Action Alternative and Alternatives I, II, III, and V but lower than Alternative IV. Only Alternative IV would provide more benefits to upland habitat for tribally important plants and animals than Alternative VI.

Impacts to Tribal Rights and Interests Relative to Fish, Wildlife, and Special Status Species

The following indicator was used to analyze the impacts of Fish, Wildlife, and Special Status Species actions on tribal rights and interests:

- Conditions of natural resources used by the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes for food, medicine, or ceremony.

Hunting and fishing continue to play important roles in the overall subsistence strategy for many tribal members. BLM actions that affect the condition of fish and wildlife habitat also affect tribal rights and interests in those resources. The fish and wildlife analyses examine the effects of management associated with vegetation communities, water resources, noxious weeds and invasive plants, wildland fire ecology and management, livestock grazing, recreation, transportation and travel, land use authorizations, minerals, and Areas of Critical Environmental Concern on general fish and wildlife habitats. Refer to the *Fish and Wildlife* section for details concerning the specific indicators, methods, and assumptions used in those analyses.

Increased human use for commercial purposes and recreation, including cross-country motorized travel, has resulted in fragmented and degraded habitat for many plants and animals. The result has been a reduction in the quality and quantity of habitat available for tribally important plant and animal species over time.

Although all native plants and animals have a role in maintaining general ecological and spiritual health for the tribes, the status of some species is elevated by the primary role they play or played in traditional cultural and religious practices. In the planning area, two such species, greater sage-grouse (sage-grouse) and California bighorn sheep (bighorn sheep), are also on the BLM's list of special status species. The analysis of impacts to the habitats of these species includes management actions associated with, vegetation communities, wildland fire, livestock grazing, recreation, transportation and travel, land use authorizations, minerals, and Areas of Critical Environmental Concern. Refer to the *Special Status Species* section for details concerning the specific indicators, methods, and assumptions used in those analyses.

The premise of this analysis is that management which results in improved habitat conditions for fish and wildlife would benefit tribal rights and interests by ensuring tribally important natural resources are available for present and future use. Management that reduces or degrades fish and wildlife habitat, or increases the risk of habitat decline, would adversely affect tribal rights and interests by diminishing the quantity and/or quality of tribally important natural resources.

The discussions below briefly summarize results of the *Fish and Wildlife* and related special status species sections presented later in this chapter. Refer to these sections for detailed information on specific management and related impacts.

Impacts from Changes to Fish, Wildlife, and Special Status Species in the No Action Alternative

Based on the analyses in the *Fish* and *Special Status Fish and Aquatic Invertebrates s*ections, the No Action Alternative, along with Alternative II, would have the highest risk of impacts to the habitat for fish and special status fish and aquatic invertebrate species of all the alternatives. Analyses in the *Wildlife* and *Special Status Wildlife* sections indicate the No Action Alternative would result in less favorable habitat conditions for wildlife and special status wildlife compared to Alternatives I, III, IV, V, and VI, but would be less impacting than Alternative II.

Based on these findings, the No Action Alternative would offer less protection for tribally important fish and wildlife resources, including sage-grouse and bighorn sheep, than all the alternatives except Alternative II.

Impacts from Changes to Fish, Wildlife, and Special Status Species in Alternative I

Alternative I would decrease the risk of impacts to fish and special status fish and aquatic invertebrate species compared to the No Action Alternative and Alternatives II and III, but would incur more risk of impacts than Alternatives IV and V. Risks to fish and special status fish and aquatic invertebrate species would be similar to Alternative VI. In addition, implementation of Alternative I would result in a minor decline in habitat conditions for wildlife and special status wildlife compared to Alternatives IV and V, but would provide less risk of habitat decline than the No Action Alternative and Alternatives II and III. Risks to habitat would be similar to Alternative VI.

Alternative I would provide more protection for tribally important fish and wildlife resources than the No Action Alternative and Alternatives II and III, the same as Alternative VI, but less than Alternatives IV and V.

Impacts from Changes to Fish, Wildlife, and Special Status Species in Alternative II

Alternative II, along with the No Action Alternative, would have the highest risk of impacts to fish and special status fish and aquatic invertebrate species. The wildlife analyses indicate Alternative II would result in more decline in habitat conditions for wildlife and special status wildlife than any of the other alternatives.

Based on these findings, Alternative II would offer less protection for tribally important fish and wildlife resources, including sage-grouse and bighorn sheep, than all the other alternatives.

Impacts from Changes to Fish, Wildlife, and Special Status Species in Alternative III

Alternative III would decrease the risk of impacts to fish and special status fish and aquatic invertebrate species compared to the No Action Alternative and Alternative II, but would incur more risk of impacts than Alternatives I, IV, V, and VI. In addition, implementation of Alternative III would result in a decline in habitat conditions for wildlife and special status wildlife compared to Alternates I, IV, V, and VI, but would provide less risk of habitat decline than the No Action Alternative and Alternative II.

Alternative III would provide more protection for tribally important fish and wildlife resources than the No Action Alternative and Alternative II, but less than Alternatives I, IV, V, and VI.

Impacts from Changes to Fish, Wildlife, and Special Status Species in Alternative IV

Alternative IV-A would decrease the risk of impacts to fish and special status fish and aquatic invertebrate species compared to the No Action Alternative and Alternatives I, II, III, and VI, but would be more risky than Alternatives IV-B and V. In addition, implementation of Alternative IV-A would result in fewer impacts to habitat conditions for wildlife and special status wildlife than any of the other alternatives.

Alternative IV-B would decrease the risk of impacts to fish and special status fish and aquatic invertebrate species compared to the No Action Alternative and Alternatives I, II, III, IV-A, and VI, but would incur slightly more risk of impacts than Alternative V. In addition, implementation of Alternative IV-B would result in fewer impacts to habitat conditions for wildlife and special status wildlife than the No Action Alternative and Alternatives I, II, III, V, and VI, but slightly more impacts than Alternative IV-A.

Alternative IV-A would provide more protection for tribally important fish and wildlife resources than the No Action Alternative and Alternatives I, II, III, and VI, and about the same as Alternative IV-B. Alternative IV-B would provide more protection for tribally important fish and wildlife resources than the No Action Alternative and Alternatives I, II, III, and VI. Alternative IV-B would result in less favorable habitat conditions for fish and more favorable habitat conditions for wildlife than Alternative V but slightly less favorable conditions for wildlife than Alternative IV-A.

Impacts from Changes to Fish, Wildlife, and Special Status Species in Alternative V

Alternative V would result in the least risk of impacts to fish and special status fish and aquatic invertebrate species compared to all the other alternatives. In addition, implementation of Alternative V would result in more improvement in habitat conditions for wildlife and special status wildlife than the No Action Alternative and Alternatives I, II, III, and VI, but would provide less improvement than Alternative IV.

Alternative V would provide more protection for tribally important fish and wildlife resources than the No Action Alternative and Alternatives I, II, III, and VI. Alternative V would result in the most favorable habitat conditions for fish of all the alternatives but slightly less favorable habitat conditions for wildlife than Alternative IV.

Impacts from Changes to Fish, Wildlife, and Special Status Species in Alternative VI (Proposed RMP)

Alternative VI would decrease the risk of impacts to fish and special status fish and aquatic invertebrate species compared to the No Action Alternative and Alternatives II and III, but would incur more risk of impacts than Alternatives IV and V. Risks to fish and special status fish and aquatic invertebrate species would be similar to Alternative I. In addition, implementation of Alternative VI would result in a minor decline in habitat conditions for wildlife and special status wildlife compared to Alternatives IV and V, but would provide less risk of impacts to habitat than the No Action Alternative and Alternatives II and III. Risks to wildlife habitat would be similar to Alternative I.

Alternative VI would provide more protection for tribally important fish and wildlife resources than the No Action Alternative and Alternatives II and III, the same as Alternative I, but less than Alternatives IV and V.

Impacts to Tribal Rights and Interests Relative to Cultural Resources

The following indicator was used to analyze the impacts of Cultural Resources actions on tribal rights and interests:

- The physical integrity and setting of places having religious and cultural importance to the tribes.

The physical integrity and setting of places of religious and cultural importance to the tribes are affected by many of the same actions that impact tribally important natural resources. Prior to 1966 and passage of the National Historic Preservation Act, cultural resources were rarely considered during Federal undertakings, and it was only in the 1990s, after amendments to the act and issuance of the Executive Memorandum of April 29, 1994, on Government-to-Government Relations with Native American Tribal Governments, Executive Order 13007 on sacred sites, and Executive Order 13175 on consultation and coordination with tribal governments, that tribal input was systematically sought to inform BLM decisions regarding effects to places of traditional religious and cultural importance to the tribes. Requirements to consider effects to traditional cultural properties and sacred sites apply only to Federal lands or Federally funded projects. Legal protections for cultural resources on State and private lands are less restrictive than on Federal lands.

The management of traditional cultural properties and sacred sites, which may or may not include archaeological remains, is of great importance to the Shoshone-Paiute Tribes and the Shoshone-Bannock Tribes. Unlike sites of purely archaeological or historical interest, effects to traditional cultural properties and sacred sites cannot be mitigated through the recovery of scientific information. Potential physical and visual impacts to cultural resources from wildland fire, Visual Resource Management, livestock grazing, recreation, transportation and travel, land use authorizations, minerals, and Areas of Critical Environmental Concern are analyzed in the *Cultural Resources* section, which details the specific indicators, methods, and assumptions used in the analysis. The cultural resource indicators concerning the physical integrity of important archaeological and traditional cultural sites and the setting of places of traditional cultural importance to the tribes are equivalent to the tribal rights and interests indicator concerning the physical integrity and setting of places of religious and cultural importance to the tribes. Therefore, the effects of the allocations and actions identified in the cultural resources analysis also apply

to tribal rights and interests. The results of that analysis are briefly presented below. Refer to the *Cultural Resources* section for the full analysis.

Impacts from Changes to Cultural Resources in the No Action Alternative

Management associated with the No Action Alternative has a greater potential to impact the integrity of properties having religious and cultural importance to the tribes than all the alternatives except Alternative II. Overall, impacts are expected to be moderate and adverse.

Impacts from Changes to Cultural Resources in Alternative I

Alternative I management allocations and actions would have a lower potential to impact places of religious and cultural importance to the tribes than the No Action Alternative and Alternatives II, III, and VI, but would have a higher potential than Alternatives IV and V. Overall, impacts are expected to be minor and adverse.

Impacts from Changes to Cultural Resources in Alternative II

Management allocations and actions in Alternative II would have the greatest potential to impact places of religious and cultural importance to the tribes of all the alternatives. Overall, impacts are expected to be moderate and adverse.

Impacts from Changes to Cultural Resources in Alternative III

Alternative III management allocations and actions would have a lower potential to impact places of religious and cultural importance to the tribes than the No Action Alternative and Alternative II, but would have a higher potential than Alternatives I, IV, V, and VI. Overall, impacts are expected to be minor and adverse.

Impacts from Changes to Cultural Resources in Alternative IV

Management associated with Alternative IV-A would have a lower potential to impact places of religious and cultural importance to the tribes than the No Action Alternative and Alternatives I, II, III, IV-B, and VI, but a higher potential than Alternative V. Overall, impacts are expected to be minor and adverse.

Alternative IV-B allocations and actions would have a lower potential to impact places of religious and cultural importance to the tribes than the No Action Alternative and Alternatives I, II, III, and VI, but a higher potential than Alternatives IV-A and V. Overall, impacts are expected to be minor and adverse.

Impacts from Changes to Cultural Resources in Alternative V

Management allocations and actions in Alternative V would have the lowest potential to impact places of religious and cultural importance to the tribes of any of the alternatives. Overall, impacts are expected to be minor and adverse.

Impacts from Changes to Cultural Resources in Alternative VI (Proposed RMP)

Management associated with Alternative VI would have a lower potential to impact places of religious and cultural importance to the tribes than the No Action Alternative and Alternatives II and III, but more than Alternatives I, IV, and V. Overall, impacts are expected to be minor and adverse.

Impacts from Visual Resources Management Actions

The following indicator was used to analyze the impacts of Visual Resource Management actions on tribal rights and interests:

- The physical integrity and setting of places having religious and cultural importance to the tribes.

The tribes value visual resources for more than their aesthetic qualities; spiritual value is also important, especially for viewsheds associated with sacred sites. The natural or undisturbed quality of the viewshed is the key component of some important tribal ceremonies. Also, because natural landscapes are a critical component of many ceremonial sites, existing and proposed developments that disrupt the natural continuity of the viewshed would diminish the availability of suitable locations for traditional religious ceremonies.

Visual Resource Management (VRM) allocations that may affect the setting of places of religious and cultural importance to the tribes are analyzed by comparing the VRM Classes for each alternative against a landscape model of resources of importance to the tribes. The model includes the sage-grouse management area, active sage-grouse leks, big game winter range, prominent buttes and ridges, all fish-bearing streams, springs, and the high cultural resource density zone as described in the *Cultural Resources* sections of Chapters 3 and 4. VRM Classes I and II would preserve the existing character of the landscape, thereby maintaining the setting of places of religious or cultural importance to the tribes. VRM Classes III and IV would allow moderate to major changes to the landscape which would, in turn, adversely impact the setting of tribally important viewsheds. Table 4-1 presents the acres of each VRM class in the area with tribally important resources for each alternative.

Table 4-1. Visual Resource Management Allocations in Tribally Important Viewsheds by Alternative (Acres)

VRM Class	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
I	115,000	106,000	70,000	70,000	126,000		70,000	86,000
II	108,000	185,000	5,000	5,000	64,000		295,000	54,000
III	266,000	89,000	18,000	292,000	313,000	282,000	617,000	229,000
IV	581,000	690,000	977,000	703,000	567,000	598,000	88,000	701,000
Total	**1,070,000**	**1,070,000**	**1,070,000**	**1,070,000**	**1,070,000**		**1,070,000**	**1,070,000**

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would manage approximately 11% of lands associated with tribally important resources as VRM Class I, 10% as VRM Class II, 25% as VRM Class III, and 54% as VRM Class IV. With approximately 21% of these lands in the more restrictive VRM classes, this would result in fewer visual impacts from BLM authorized activities to tribally important viewsheds than Alternatives II, III, IV, and VI, but more than Alternatives I and V. Overall, impacts from VRM the setting of places having religious and cultural importance to the tribes would be moderate and adverse.

Impacts from Management Specific to Alternative I

Under Alternative I, over 10% of lands associated with tribally important resources would be managed as VRM Class I, 17% as VRM Class II, 8% as VRM Class III, and 65% as VRM Class IV. With approximately 27% of lands in the more restrictive VRM classes, Alternative I would result in fewer visual impacts from BLM authorized activities to tribally important viewsheds than the No Action Alternative and Alternatives II, III, IV, and VI, but more than Alternative V. VRM under Alternative I would protect the visual setting of places of religious and cultural importance to the tribes on 68,000 more acres than under existing management. Overall, impacts from VRM on tribal rights and interests would be minor and beneficial.

Impacts from Management Specific to Alternative II

Alternative II would manage approximately 7% of lands associated with tribally important resources as VRM Class I, less than 1% as VRM Class II, 2% as VRM Class III, and 91% as VRM Class IV. This alternative, along with Alternative III, places the fewest acres in the more restrictive VRM classes and the most, by far, in the least restrictive VRM class. Alternative II is expected to result in more visual impacts from BLM authorized activities to tribally important viewsheds than any other alternative. VRM under Alternative II would protect the visual setting of places of religious and cultural importance to the tribes on 148,000 fewer acres than under existing management. Overall, impacts from VRM on tribal rights and interests would be moderately high and adverse.

Impacts from Management Specific to Alternative III

Alternative III would manage approximately 7% of lands associated with tribally important resources as VRM Class I, less than 1% as VRM Class II, 27% as VRM Class III, and 66% as VRM Class IV. Along with Alternative II, this alternative allocates the least area to the most restrictive VRM classes. Alternative III would result in more visual impacts from BLM authorized activities to tribally important viewsheds than the No Action Alternative and Alternatives I, IV, V, and VI. Because it places substantially less land under

the least restrictive VRM Class IV management, it would result in fewer impacts to tribally important viewsheds than Alternative II. VRM under Alternative III would protect the visual setting of places of religious and cultural importance to the tribes on 148,000 fewer acres than under existing management. Overall, impacts from VRM on tribal rights and interests would be moderately high and adverse.

Impacts from Management Specific to Alternative IV

Alternatives IV-A and IV-B would each manage approximately 12% of lands associated with tribally important resources as VRM Class I and 6% as VRM Class II. Alternative IV-A would manage 29% as VRM Class III and 53% as VRM Class IV, while Alternative IV-B would manage 26% as VRM Class III and 56% as VRM Class IV. With approximately 18% of these lands in the more restrictive management classes, these alternatives would result in fewer visual impacts from BLM authorized activities to tribally important viewsheds than Alternatives II, III, and VI, but more than the No Action Alternative and Alternatives I and V. Alternative IV-A would place fewer acres in the least restrictive VRM class than Alternative IV-B, resulting in fewer impacts to tribally important viewsheds. VRM under Alternative IV would protect the visual setting of places of religious and cultural importance to the tribes on 33,000 fewer acres than under existing management. Overall, impacts from VRM on tribal rights and interests would be moderate and adverse.

Impacts from Management Specific to Alternative V

Alternative V would manage just under 7% of lands associated with tribally important resources as VRM Class I, just under 28% as VRM Class II, 58% as VRM Class III, and only 8% as VRM Class IV. With approximately 35% of these lands in the more restrictive VRM classes and the fewest acres allocated to VRM Class IV, Alternative V would result in fewer visual impacts from BLM authorized activities to tribally important viewsheds than any of the alternatives. VRM under Alternative V would protect the visual setting of places of religious and cultural importance to the tribes on 142,000 more acres than under existing management. Overall, impacts from VRM on tribal rights and interests would be moderate and beneficial.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would manage 8% of lands associated with tribally important resources as VRM Class I, 5% as VRM Class II, 21% as VRM Class III, and 66% as VRM Class IV. With approximately 13% of these lands in the more restrictive management classes, this alternative would result in fewer visual impacts from BLM authorized activities to tribally important viewsheds than Alternatives II and III, but more than the No Action Alternative and Alternatives I, IV, and V. VRM under Alternative VI would protect the visual setting of places of religious and cultural importance to the tribes on 83,000 fewer acres than under existing management. Overall, impacts from VRM on tribal rights and interests would be moderate and adverse.

Impacts from Land Tenure Actions

The following indicator was used to analyze the impacts of Land Tenure actions on tribal rights and interests:

- Accessibility of BLM-managed lands for the exercise of treaty rights or tribal interests.

Land tenure management can impact tribal rights and interests because treaty rights and trust responsibilities are linked to Federal land ownership; the disposal of public land diminishes the land base available for tribal members to exercise off-reservation treaty rights and may decrease access to other public lands. Many resources of importance to the tribes passed from Federal to private ownership under a series of property laws including the Homestead Act of 1862, the Desert Land Act of 1877, and the Carey Act of 1894. Over the last 140 years, the Federal government has transferred hundreds of thousands of acres of public land, once available for tribal use, to State and private ownership. Along with the land went the natural and cultural resources they contained. Euro-American reliance on agriculture and water for irrigation resulted in the acquisition of many sites traditionally used by the tribes including prime fishing locations, hot springs, and winter campgrounds along the Snake River.

Land tenure adjustments in the planning area over the last 20 years have been relatively minor, resulting in a net loss of approximately 4,000 acres of Federal land.

For this analysis, the land tenure allocations for retention, exchange, and sale in each alternative are compared to the existing public land base. Lands in Zone 1 are for retention only. This allocation would have a beneficial effect on tribal rights and interests by maintaining the land base to which they are attached. Zone 2 lands are for exchange or lease although, historically, exchanges have been more common. The effects of this allocation are expected to be neutral because lands received in exchange would generally contain resources of equal or greater resource value as the lands released. Lands in Land Tenure Zone 3 have the highest potential to adversely affect tribal rights and interests because those lands would be available for sale. Impacts to the tribes from the sale of Federal lands include loss of hunting, fishing, and gathering rights; loss of access to tribally important resources; and, loss of rights to consult on development projects or other activities which might affect the condition, integrity and setting of natural and cultural resources of importance to the tribes. Table 4-2 presents the land tenure allocations by alternative.

Table 4-2. Land Tenure Zone Allocations by Alternative (Acres)

Land Tenure Zone	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Zone 1 (Retention)	1,299,000	1,108,000	977,000	1,108,000	1,137,000	1,136,000	1,282,000	1,326,000
Zone 2 (Potential for Exchange or Recreation and Public Purposes Act [R&PP] Lease)	3,000	243,000	348,000	243,000	219,000	220,000	89,000	32,000
Zone 3 (Potential for Sale, Exchange, or R&PP Lease)	69,000	20,000	46,000	20,000	16,000		0	13,000

[A] Zone 1 includes No Action retention lands; Zone 2 includes No Action Zone T3; and Zone 3 includes No Action Zones T1, T2, and T4.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would allocate less than 1% of the planning area to Land Tenure Zones T1 (sale only), T2 (sale or exchange), and T3 (exchange only), and 5% to Zone T4 (available for agricultural disposal). As a result, just over 5% of the public lands in the planning area would be available for disposal or transfer out of Federal ownership. Disposal of public lands would adversely affect tribal rights and interests as described in the preceding paragraph. Although the No Action Alternative has the second highest number of acres in the retention category, preserving just under 95% of the land base for tribal rights and interests, it also makes the most acres available for outright sale or disposal under the Desert Land Act and Carey Act. In addition, the No Action Alternative is silent concerning tribal rights and interests while the action alternatives would make tribal interests a priority when considering land tenure adjustments.

Impacts from Management Common to All Action Alternatives

Criteria for retention and acquisition under all action alternatives include lands specifically identified by the tribes as having special importance to tribal rights and interests. In addition, new applications for disposal of land through the Desert Land Act or Carey Act programs would not be accepted. These actions would reduce potential impacts to tribal rights and interests in comparison to the No Action Alternative.

Impacts from Management Specific to Alternatives I and III

Under Alternatives I and III, 81% of the planning area would be in Zone 1 (retention), where impacts are expected to be beneficial; 18% would be in Zone 2 (exchange or lease), where neutral impacts are

expected; and 1% would be in Zone 3 (sale or lease), where adverse impacts are expected. Based on the amount of land available for disposal, Alternatives I and III would have more potential to adversely impact tribal rights and interests than Alternatives IV, V, and VI and less potential than the No Action Alternative and Alternative II. Although the No Action Alternative has more land in the retention category, it also has substantially more land in the potential sale category. Land tenure allocations in Alternatives I and III would result in beneficial impacts to tribal rights and interests from public land retention on 191,000 fewer acres and adverse impacts from disposal on 49,000 fewer acres compared to current management.

Impacts from Management Specific to Alternative II

Alternative II would place just over 71% of public lands in Zone 1, while 25% would be in Zone 2, and just over 3% would be in Zone 3. This alternative would make more acres available for disposal (Zones 2 and 3) than any of the alternatives and, in that sense, has the most potential to adversely impact tribal rights and interests. Land tenure allocations in Alternative II would result in beneficial impacts to tribal rights and interests from public land retention on 322,000 fewer acres and adverse impacts from disposal on 23,000 fewer acres compared to current management.

Impacts from Management Specific to Alternative IV

Alternative IV would place 83% of public lands in Zone 1, while 16% would be in Zone 2, and 1% would be in Zone 3. This alternative would make less land available for disposal than Alternatives I, II, and III but more than the No Action Alternative and Alternatives V and VI. Only Alternatives V and VI would have less potential to impact tribal rights and interests than Alternative IV. Land tenure allocations in Alternative IV would result in beneficial impacts to tribal rights and interests from public land retention on approximately 163,000 fewer acres and adverse impacts from disposal on 53,000 fewer acres compared to current management.

Impacts from Management Specific to Alternative V

Alternative V would place 94% of the planning area in Zone 1, while 6% would be in Zone 2. No lands would be in Zone 3. Only the No Action Alternative and Alternative VI would manage more land for retention. Alternative V would have less potential to impact tribal rights and interests than the No Action Alternative and Alternatives I, II, III, and IV but would have slightly more potential than Alternative VI because it makes more land available for exchange or R&PP lease. Land tenure allocations in Alternative V would result in beneficial impacts to tribal rights and interests from public land retention on approximately 17,000 fewer acres and adverse impacts from disposal on 69,000 fewer acres compared to current management.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would place 97% of public lands in Zone 1, while 2% would be in Zone 2, and 1% would be in Zone 3. By retaining more public land and prioritizing tribal input in retention and acquisition criteria, this alternative would have the least potential to impact tribal rights and interests. Land tenure allocations in Alternative VI would result in beneficial impacts to tribal rights and interests from public land retention on approximately 27,000 more acres and adverse impacts from disposal on 56,000 fewer acres compared to current management.

Summary of Direct and Indirect Impacts

This section summarizes the effects of the alternatives on tribal rights and interests.

Impacts from the No Action Alternative

Overall, only Alternative II would result in more impacts to tribal rights and interests than the No Action Alternative. These impacts would be moderate and adverse.

The No Action Alternative would pose a higher risk of impacts to native upland vegetation than any of the alternatives and would be second only to Alternative II in impacts to fish and wildlife habitat. As a result, the No Action Alternative, along with Alternative II, would have more impact on the conditions of natural resources used by the tribes than Alternatives I, III, IV, V, and VI.

The cultural resources analysis indicates the No Action Alternative would have more potential to impact the physical integrity of cultural resources than any of the alternatives except Alternative II. The visual resources analysis concludes the No Action Alternative would result in fewer impacts to tribally important viewsheds than Alternatives II, III, IV, and VI, but more than Alternatives I and V. The No Action Alternative is expected to result in moderate impacts to the physical integrity and visual setting of places having religious and cultural importance to the tribes.

The land tenure analysis indicates the No Action Alternative has a higher potential to adversely impact tribal rights and interests, through disposal of public land, than all the alternatives except Alternative II.

Impacts from Alternative I

Overall, Alternative I would result in more impacts to tribal rights and interests than Alternatives IV and V, about the same as Alternative VI, but less than the No Action Alternative and Alternatives II and III. These impacts would be minor and beneficial.

Alternative I would pose a higher risk of impacts to native upland vegetation than Alternatives IV and VI, but would have a lower risk than the No Action Alternative and Alternatives II, III, and V. Risk of impacts to fish and wildlife habitat under Alternative I would be more than Alternatives IV and V, about the same as Alternative VI, but less than the No Action Alternative and Alternatives II and III. As a result, Alternative I would have a moderate and beneficial impact on the conditions of natural resources used by the tribes.

The cultural resources analysis indicates Alternative I would have more potential to impact the physical integrity of cultural resources than Alternatives IV and V, but less than the No Action Alternative and Alternatives II, III, and VI. The visual resources analysis concludes Alternative I would result in fewer impacts to tribally important viewsheds than the No Action Alternative and Alternatives II, III, IV, and VI, but more than Alternative V. Alternative I is expected to result in minor adverse impacts to the physical integrity, and minor beneficial impacts to the visual setting, of places having religious and cultural importance to the tribes.

The land tenure analysis indicates Alternative I has a higher potential to adversely impact tribal rights and interests, through disposal of public land, than Alternatives IV, V, and VI, the same potential as Alternative III, and less potential than the No Action Alternative and Alternative II.

Impacts from Alternative II

Overall, Alternative II would result in more impacts to tribal rights and interests than any of the alternatives because more land would be allocated for commodity uses and those activities would be more intense than under other alternatives. These impacts would be moderate and adverse.

Only the No Action Alternative would pose a higher risk of impacts to native upland vegetation than Alternative II. In addition, Alternative II would have more risk of impacts to fish and wildlife habitat than any of the alternatives. As a result, Alternative II, along with the No Action Alternative, would have more impact on the conditions of natural resources used by the tribes than Alternatives I, III, IV, V, and VI.

The cultural resources and visual resources analyses indicate Alternative II would have a higher potential to impact the physical integrity of cultural resources and tribally important viewsheds than any of the other alternatives. Alternative II is expected to result in moderate impacts to the physical integrity, and moderately high impacts to the visual setting, of potential places having religious and cultural importance to the tribes.

The land tenure analysis indicates Alternative II has a higher potential to adversely impact tribal rights and interests, through disposal of public land, than any of the other alternatives.

Impacts from Alternative III

Overall, Alternative III would result in more impacts to tribal rights and interests than Alternatives I, IV, V, and VI, but fewer than the No Action Alternative and Alternative II. These impacts would be minor, but adverse.

Alternative III would pose a higher risk of impacts to native upland vegetation than Alternatives I, IV, V, and VI, but would have a lower risk than the No Action Alternative and Alternative II. Risk of impacts to fish and wildlife habitat under Alternative III would be higher than Alternatives I, IV, V, and VI, but lower than the No Action Alternative and Alternative II. As a result, Alternative III, in relation to the other alternatives, would have a moderately large impact on the conditions of natural resources used by the tribes.

The cultural resources analysis indicates Alternative III would have more potential to impact the physical integrity of cultural resources than Alternatives I, IV, V, and VI, but less than the No Action Alternative and Alternative II. The visual resources analysis concludes Alternative III would result in fewer impacts to tribally important viewsheds than Alternative II, but more than the No Action Alternative and Alternatives I, IV, V, and VI. Alternative III is expected to result in minor impacts to the physical integrity, and moderately high impacts to the visual setting, of places having religious and cultural importance to the tribes.

The land tenure analysis indicates Alternative III has a higher potential to adversely impact tribal rights and interests, through disposal of public land, than Alternatives IV, V, and VI, the same potential as Alternative I, and less potential than the No Action Alternative and Alternative II.

Impacts from Alternative IV

Overall, Alternative IV would result in more impacts to tribal rights and interests than Alternative V, but less than the No Action Alternative and Alternatives I, II, III, and VI. These impacts would be minor and beneficial.

Alternative IV would pose the least risk of impacts to native upland vegetation of any of the alternatives. Risk of impacts to fish habitat under Alternative IV-A would be higher than Alternatives IV-B and V, but lower than all the other alternatives; risk of impacts to fish under Alternative IV-B would be less than all the alternatives except Alternative V. Impacts to wildlife habitat under Alternative IV-A would be less than any of the other alternatives, while impacts under Alternative IV-B would be lower than all but Alternative IV-A. As a result, Alternative IV, along with Alternative V, would have the lowest impacts on the conditions of natural resources used by the tribes.

The cultural resources analysis indicates Alternative IV-A would have a lower potential to impact the physical integrity of cultural resources than any of the alternatives except Alternative V, while Alternative IV-B would have the third lowest potential. The visual resources analysis concludes Alternative IV-A would result in fewer impacts to tribally important viewsheds than Alternatives II, III, IV-B, and VI, but more than the No Action Alternative and Alternatives I and V. Alternative IV-B would result in fewer visual impacts than Alternatives II, III, and VI, but more than the other alternatives. Alternative IV is expected to result in minor impacts to the physical integrity, and moderate impacts to the visual setting, of places having religious and cultural importance to the tribes.

The land tenure analysis indicates Alternative IV has a higher potential to adversely impact tribal rights and interests, through disposal of public land, than Alternatives V and VI, but lower potential than the No Action Alternative and Alternatives I, II, and III.

Impacts from Alternative V

Overall, Alternative V would result in fewer impacts to tribal rights and interests than any of the alternatives. These impacts would be moderate and beneficial.

Alternative V would pose a higher risk of impacts to native upland vegetation than Alternatives IV-A and VI, but less risk than the other alternatives. It would also result in the most potential for improvement in fish and fish habitat of all the alternatives. Impacts to wildlife habitat under Alternative V would be more than Alternative IV, but less than the No Action Alternative and Alternatives I, II, III, and VI. As a result, Alternative V would have a low impact on the condition of natural resources used by the tribes.

The cultural resources analysis indicates Alternative V would have the lowest potential to impact the physical integrity of cultural resources of all the alternatives. The visual resources analysis concludes Alternative V would result in fewer impacts to tribally important viewsheds than any of the alternatives.

Alternative V is expected to result in minor adverse impacts to the physical integrity, and moderate beneficial impacts to the visual setting of places having religious and cultural importance to the tribes.

The land tenure analysis indicates Alternative V has less potential to adversely impact tribal rights and interests, through disposal of public land, than all the alternatives except Alternative VI.

Impacts from Alternative VI (Proposed RMP)

Overall, Alternative VI would result in more impacts to tribal rights and interests than Alternatives IV and V, about the same level as Alternative I, but less than the No Action Alternative and Alternatives II and III. These impacts would be minor and beneficial.

Alternative VI would pose a higher risk of impacts to native upland vegetation than Alternative IV, but would have a lower risk than the No Action Alternative and Alternatives I, II, III, and V. Risk of impacts to fish and wildlife habitat under Alternative VI would be more than Alternatives I, IV, and V, but less than the No Action Alternative and Alternatives II and III. As a result, Alternative VI would have a moderate risk of impacts to the conditions of natural resources used by the tribes.

The cultural resources analysis indicates Alternative VI would have more potential to impact the physical integrity of cultural resources than Alternatives I, IV, and V, but less than the No Action Alternative and Alternatives II and III. The visual resources analysis concludes Alternative VI would result in fewer impacts to tribally important viewsheds than Alternatives II and III, but more than the No Action Alternative and Alternatives I, VI, and V. Alternative VI is expected to result in minor adverse impacts to the physical integrity, and moderate adverse impacts to the visual setting of places having religious and cultural importance to the tribes.

The land tenure analysis indicates Alternative VI would have the least potential to adversely impact tribal rights and interests through disposal of public land of all the alternatives.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The analysis area for cumulative impacts to tribal rights and interests includes the planning area and surrounding portions of southern Idaho and northern Nevada, including the Bruneau, Burley, Shoshone, Four Rivers, and Wells (NV) Field Offices, and the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest. This area represents the portion of the traditional homeland of the Shoshone-Paiute and Shoshone-Bannock Tribes which may experience cumulative impacts from allocations and actions associated with the Jarbidge RMP. The temporal scope of the analysis is 20 years or the life of the plan. This section examines the effects of additive and interactive impacts that result when human activities are repeated over time and space.

Past, present, and reasonably foreseeable actions for the following resource uses cumulatively affect tribal rights and interests:

- Recreation,
- Transportation and Travel, and
- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter. Incremental impacts are expected where new right-of-way (ROW) developments are added to existing developments within tribally important viewsheds. Dispersed recreation is expected to produce incremental impacts from repeated use of existing camping, fishing, and hiking areas as well as the continued spread of recreators into more remote locations. Motorized travel and demands for access are expected to increase resulting in incremental impacts to primitive roads and to remote settings. Together these uses produce cumulative impacts to tribal rights and interests through incremental impacts to the condition of tribally important natural resources and the integrity and setting of places having religious and cultural importance to the

tribes. These impacts are common to all but vary in intensity with the direct and indirect impacts of the each alternative.

Summary of Cumulative Impacts

Cumulative Impacts for the No Action Alternative

Demands for use of public lands for ROW development, recreation, and associated access are expected to increase with population growth in the region. With the additional expectation that travel management allocations for surrounding BLM offices will limit recreational cross-country motorized vehicle use to relatively small play areas, such use in the planning area would likely increase due to the large open areas under the No Action Alternative. Energy corridors and wind energy developments would be likely to impact Federal, State, and private lands, where permitted, throughout the analysis area, thereby increasing impacts to native vegetation, fish and wildlife, traditional religious sites and associated viewsheds.

In terms of cumulative impacts, the primary effect on tribal rights and interests would be the expected increase in cross-country motorized vehicle use. Such use would increase impacts to the conditions of native plant and wildlife habitat and to places of religious and cultural importance to the tribes.

Cumulative Impacts from Alternatives I, III, IV, and VI (Proposed RMP)

With greater restrictions on cross-country motorized vehicle use under these alternatives, motorized recreators may turn to State lands within the planning area or to adjacent public lands with fewer restrictions. Cumulative impacts from such use would probably be short-lived since adjacent public lands either have already adopted travel plans or, due to National BLM policy, will soon develop travel management plans that are likely to limit cross-country motorized travel. Also, ROW restrictions on the locations of wind energy developments may result in more use of suitable State and private lands or adjacent public lands with fewer restrictions. Development of State and private lands would make resources of importance to the tribes vulnerable to loss due to a lack of statutory and regulatory protection.

With the above exceptions, implementation of Alternatives I, III, IV, and VI is not expected to affect other Federal, State, or private lands in the analysis area. Incremental effects to tribal rights and interests under these alternatives would be more than Alternative V but less than the No Action Alternative and Alternative II.

Cumulative Impacts from Alternative II

Alternative II would have the fewest restrictions on commercial use and development and could accommodate larger-scale wind energy projects and/or other commercial developments than the other alternatives. Some of these developments would be expected to extend beyond the planning area into adjacent field offices. Large-scale developments that include combinations of Federal, State, and private lands are more likely under this alternative. Transportation and travel route density is expected to increase over the widest area. This alternative also has the most potential to adversely affect tribal rights and interests through future reductions in the public land base related to land tenure transactions. The combination of direct, indirect, and cumulative impacts is expected to be highest under Alternative II.

Cumulative Impacts from Alternative V

Alternative V would place the most restrictions on land tenure transactions, commercial development and livestock grazing of all the alternatives. These restrictions could lead to increased developments on State and private lands where tribal interests would be vulnerable to loss due to a lack of statutory and regulatory protection. Transportation and travel route density would be least of all alternatives. Although demands for public lands would continue throughout the region, cumulative impacts to tribal rights and interests would be lowest under this alternative.

4.3 RESOURCES

4.3.1 Air and Atmospheric Values

4.3.1.1 Air Quality

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to air quality:

- **The amount of particulate matter ($PM_{2.5}$ and PM_{10}) in the air** – The amount of particulate matter is a measurable indicator of whether the National Ambient Air Quality Standards (NAAQS) and Idaho Department of Environmental Quality air quality standards are met. Particulate matter consists of tiny particles of solid or liquid suspended in the air. $PM_{2.5}$ and PM_{10} are particles with diameters of 2.5 microns or less or 10 microns or less, respectively, and are two pollutants regulated by NAAQS. Other pollutants regulated by NAAQS such as sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead (40 CFR Part 50) do not currently occur at measurable levels in the planning area. These pollutants are not predicted to be generated in substantial quantities from BLM management actions as described in Chapter 2. The planning area is currently in an attainment area (a geographic area that meets or has pollutant levels below the NAAQS) for particulate matter (DEQ, 2012b). Particulate matter is currently the most common criteria air pollutant of concern in Idaho because particulate sources are widespread throughout the State. Common sources include windblown dust, road dust, smoke, industrial emissions, and motor vehicle emissions (DEQ, 2012b).

Methods and Assumptions

The primary air quality concerns in the planning area include smoke from wildland and prescribed fires and dust generation from activities associated with transportation and travel management and surface-disturbing vegetation treatments. Impacts to air quality from management in the following sections of Chapter 2 were analyzed in detail: *Air Quality*, *Upland Vegetation*, *Wildland Fire Ecology and Management*, and *Transportation and Travel*. Impacts from management in the *Recreation* section were not analyzed in detail because the impacts were captured in the analysis of transportation and travel actions. Management in the *Noxious Weeds and Invasive Plants, Livestock Grazing, Minerals,* and *Land Use Authorizations* sections generate particulate matter, but were not analyzed because the management and impact did not vary measurably between alternatives. Management in the remaining sections was not analyzed in detail because either the impact did not vary measurably between alternatives or impact the indicator for air quality.

Upland Vegetation

Vegetation treatments using prescribed fire generate particulate matter. The total amount of particulate matter produced through prescribed fire is directly related to the total acres of vegetation treatments implemented under each alternative using prescribed fire. Total potential acres treated with prescribed fire were estimated for each alternative.

Total particulate matter emissions were calculated using a smoke modeling program[1] to determine rate of emissions. Emission rates were calculated based on vegetation type and the corresponding fuel model.

Particulate matter, specifically fugitive dust, may also be produced through surface-disturbing mechanical vegetation treatments. The total amount of potential particulate matter produced from surface-disturbing mechanical treatments is directly related to the total acres of vegetation treatments implemented under

[1] Simple Approach Smoke Estimation Model, Version 4.1.0 (Breyfogle and Ferguson, 1996; Sestak, 2002; Sestak & Riebau, 1988).

each alternative that may use mechanical methods as a tool. Total potential acres treated by mechanical methods were estimated for each alternative.

Assumptions for the analysis of impacts to air quality from vegetation communities actions include the following:

- Most mechanical treatments would occur during times with relatively high soil moisture, which would reduce the potential for fugitive dust.
- Prescribed fire and mechanical treatments that create particulate matter would be isolated to site-specific treatments spread over the life of the plan.

Wildland Fire Ecology and Management

Vegetation treatments implemented through wildland fire ecology and management actions are addressed through the analysis of mechanical treatments and prescribed fire treatments under *Impacts from Upland Vegetation Actions* as the impacts from these actions would be the same.

Wildland fires are an integral part of ecosystem function, but air pollutants emitted by those fires can degrade air quality, cause human health effects, and create regional haze impacts. Characterization of the effects of wildland fires on ambient air quality is incomplete and difficult to quantify due to the lack of air monitoring stations in rural areas. Smoke plumes degrade air quality locally during the period of time of smoke emission and several hours after combustion has ceased. These short-lived effects would likely be a nuisance, but may affect health and may result in localized violations of NAAQS. Smoke-related violations of the NAAQS are based on 24-hour and yearly averages and may not be a regulatory issue (USDA, 2002).

Assumptions for the analysis of impacts to air quality from wildland fire ecology and management actions include the following:

- Particulate matter generated from wildland fire smoke is directly related to the size and frequency of wildland fires.
- Alternatives in which Fire Regime Condition Class (FRCC) is closest to the desired level (FRCC 1) would have less frequent wildland fires. Successional class (S-Class) similarity is used to correlate the potential for frequency of wildland fires. S-Class similarity is the closeness to which each current or expected vegetation successional class matches the simulated historical reference conditions. As the amount of acres achieving S-Class similarity increases, the potential for frequent and large wildland fires decreases.

Transportation and Travel Management

Fugitive dust raised by vehicles traveling on unpaved roads and trails and by off-highway vehicles (OHVs) travelling cross-country can contribute to air quality concerns. Vehicle emissions, particularly from vehicles with 2-stroke engines (e.g., OHVs), also contribute to air quality concerns. Fugitive dust suspended in the air may impact more total area than any other impact of paved or unpaved roads and it can have significant effects on ecosystems (Ouren et al., 2007). Fugitive dust is created and raised into the air as vehicles disturb soil crusts, abrade and pulverize soils, and generate wind currents. Once soil surfaces are disturbed, wind erosion may increase the amount of debris flow (Ouren et al., 2007).

A recent study indicates most of the particulate matter generated from motorized vehicles were in size classes greater than 2.5 microns and traveled less than 50 meters away from the point of generation. This observation is specific to soil conditions, weather, and vehicle types. The study determined that spikes in particulate matter in excess of the NAAQS standard (150 micrograms per cubic meter) were common when vehicles were passing particulate monitoring stations (Padgett et al., 2007).

Generation of particulate matter from vehicles travelling cross-country is directly related to the size of areas designated as open to cross-country motorized vehicle use, limited to existing or designated routes or ways, or closed to motorized vehicle use. Assumptions for the analysis of impacts to air quality from transportation and travel management include the following:

- Areas open to cross-country motorized vehicle use would experience the highest levels of particulate matter with the particulate matter being more concentrated in open areas of smaller size.
- Areas open to cross-country motorized vehicle use would have an increased potential for particulate matter generated through wind erosion.
- Areas limited to existing or designated routes would experience particulate matter generation, but the effects would be spatially limited to approximately 164 feet from the route.
- Areas closed to motorized vehicle use would not experience impacts to air quality from motorized vehicle use.
- The high-use time period for motorized recreation in this area is from November to March when soil conditions are relatively moist and dust generation is diminished.

Direct and Indirect Impacts

Impacts from Air Quality Actions

Impacts from Management Common to All Alternatives

Federal and State air quality standards for $PM_{2.5}$ and PM_{10} (particulate matter with diameters of 2.5 microns or less or 10 microns or less, respectively) would continue to be met, and the planning area would continue to be managed as a Class II Airshed.

Impacts from Upland Vegetation Actions

Impacts from Management Specific to the No Action Alternative

Prescribed fire would be allowed under the No Action Alternative as a tool for vegetation treatments. Particulate matter produced from prescribed fires would impact air quality and could exceed National Ambient Air Quality Standards for particulate matter during smoke production and several hours after burning ceases. The planning area usually experiences strong transport winds that tend to clear smoke from the area quickly; as a result, impact from prescribed fire smoke would be minor and short-term, not lasting beyond a single burning period or day. However, the potential increase in wind erosion would result in an increase in particulate matter from wind-blown dust. Vegetation treatments that may include prescribed fire as a tool in each vegetation sub-group (VSG) include 6,000 acres of Annual, 49,000 acres of Non-Native Perennial, 21,000 acres of Non-Native Understory, and 22,000 acres of Native Shrubland.

All potential prescribed fires over the life of the plan would result in estimated emissions of 1,711 tons of $PM_{2.5}$ and 2,139 tons of PM_{10} (Table 4-3). This would be less than the emissions for Alternatives II, III, IV, and VI, but more than the total emissions for Alternatives I and V due to prescribed fire.

Table 4-3. Total Particulate Matter Emissions from Prescribed Fire in the No Action Alternative

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of $PM_{2.5}$ Emissions (tons/acres)	Total $PM_{2.5}$ Emissions (tons)	Rate of PM_{10} Emissions (tons/acres)	Total PM_{10} Emissions (tons)
Annual	6,000	0.019	114	0.026	156
Non-Native Perennial	49,000	0.010	490	0.013	637
Non-Native Understory	21,000	0.015	315	0.018	378
Native Shrubland	22,000	0.036	792	0.044	968
Total	**98,000**		**1,711**		**2,139**

Mechanical vegetation treatments would continue to occur within the planning area on potentially 98,000 acres. Surface-disturbing mechanical treatments may increase the potential for wind erosion until precipitation is of a duration and quantity to stabilize the soil or until vegetation growth stabilizes the soil. Since mechanical treatments are usually implemented in the fall, this period lasts one to six months or until early spring. The potential increase in wind erosion would result in an increase in particulate matter from wind-blown dust. The No Action Alternative would mechanically treat fewer acres than all other alternatives.

Impacts from Management Specific to Alternative I

Prescribed fire would not be allowed under Alternative I; therefore, no impacts to air quality from prescribed fire would occur. As a result, there would be no emissions of $PM_{2.5}$ and PM_{10} that would be produced through prescribed fire, resulting in less emission than any other alternative.

Mechanical vegetation treatments would occur on up to 377,000 acres. Surface-disturbing mechanical treatments may increase the potential for wind erosion for the period of time until precipitation or vegetation growth stabilizes the soil. The potential increase in wind erosion would result in an increase in particulate matter from wind-blown dust localized to the area near the treatment. Alternative I would use mechanical treatments on more acres and would pose a greater risk for increased particulate matter from mechanical treatments than the No Action Alternative and Alternatives II and III, but fewer acres than Alternatives IV, V, and VI.

Impacts from Management Specific to Alternative II

Prescribed fire would be allowed under Alternative II. Impacts would be the same types as those described in the No Action Alternative. Vegetation treatments that may include prescribed fire as a tool would occur on 80,000 acres of the Annual VSG and 20,000 acres of the Non-Native Understory VSG.

All potential prescribed fires over the life of the plan would result in estimated emissions of 1,820 tons of $PM_{2.5}$ and 2,440 tons of PM_{10} (Table 4-4). This would be less than the total emissions for Alternatives IV and VI, but more than the total emissions for the No Action Alternative and Alternatives I, III, and V due to prescribed fire.

Table 4-4. Total Particulate Matter Emissions from Prescribed Fire in Alternative II

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of $PM_{2.5}$ Emissions (tons/acre)	Total $PM_{2.5}$ Emissions (tons)	Rate of PM_{10} Emissions (tons/acre)	Total PM_{10} Emissions (tons)
Annual	80,000	0.019	1,520	0.026	2,080
Non-Native Understory	20,000	0.015	300	0.018	360
Total	**100,000**		**1,820**		**2,440**

Mechanical vegetation treatments would occur on up to 100,000 acres. Impacts would be the same as Alternative I but would occur over an estimated 277,000 fewer acres, most likely resulting in less particulate matter emission. Alternative II would mechanically treat more acres and would pose a greater risk for increased particulate matter than the No Action Alternative, but fewer acres than Alternatives I, III, IV, V, and VI.

Impacts from Management Specific to Alternative III

Prescribed fire would be allowed under Alternative III. Impacts would be the same types as those described in the No Action Alternative. Vegetation treatments that may include prescribed fire in each VSG include 72,000 acres of Annual, 7,000 acres of Non-Native Perennial, 2,000 acres of Non-Native Understory, 20,000 acres of Native Grassland, and 4,000 acres of Native Shrubland.

All potential prescribed fires over the life of the plan would result in estimated emissions of 1,812 tons of $PM_{2.5}$ and 2,435 tons of PM_{10} (Table 4-5). This would be less than the total emissions for Alternatives II, IV, and VI, but more than the total emissions for the No Action Alternative and Alternative I and V due to prescribed fire.

Table 4-5. Total Particulate Matter Emissions from Prescribed Fire in Alternative III

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of $PM_{2.5}$ Emissions (tons/acres)	Total $PM_{2.5}$ Emissions (tons)	Rate of PM_{10} Emissions (tons/acres)	Total PM_{10} Emissions (tons)
Annual	72,000	0.019	1,368	0.026	1,872
Non-Native Perennial	7,000	0.010	70	0.013	91
Non-Native Understory	2,000	0.015	30	0.018	36
Native Grassland	20,000	0.010	200	0.013	260
Native Shrubland	4,000	0.036	144	0.044	176
Total	**105,000**		**1,812**		**2,435**

Mechanical vegetation treatments would occur on up to 308,000 acres. Impacts would be the same as Alternative I but would occur over an estimated 69,000 fewer acres, most likely resulting in less particulate matter emission. Alternative III would mechanically treat more acres and would pose a greater risk for increased particulate matter than the No Action Alternative and Alternative II, but fewer acres than Alternatives I, IV, V, and VI.

Alternative III would also create up to 19,000 acres of unvegetated fuel breaks throughout the planning area. Wind erosion on these treated areas would also create an increase in particulate matter affecting air quality. Impacts to air quality from unvegetated fuel breaks would only occur for this alternative.

Impacts from Management Specific to Alternative IV

Prescribed fire would be allowed under Alternative IV. Impacts would be the same types as those described in the No Action Alternative. Vegetation treatments that may include prescribed fire in each VSG include 80,000 acres of Annual and 134,000 acres of Non-Native Perennial.

All potential prescribed fires over the life of the plan would result in estimated emissions of 2,860 tons of $PM_{2.5}$ and 3,822 tons of PM_{10} (Table 4-6). Alternative IV would have more total emissions of $PM_{2.5}$ and PM_{10} produced due to prescribed fire than any other alternatives.

Table 4-6. Total Particulate Matter Emissions from Prescribed Fire in Alternative IV

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of $PM_{2.5}$ Emissions (tons/acre)	Total $PM_{2.5}$ Emissions (tons)	Rate of PM_{10} Emissions (tons/acre)	Total PM_{10} Emissions (tons)
Annual	80,000	0.019	1,520	0.026	2,080
Non-Native Perennial	134,000	0.010	1,340	0.013	1,742
Total	**214,000**		**2,860**		**3,822**

Mechanical vegetation treatments would occur on up to 623,000. Impacts would be the same as Alternative I but would occur over an estimated 246,000 more acres, most likely resulting in more particulate matter emission. Alternative IV would mechanically treat more acres and would pose a greater risk for increased particulate matter than any other alternatives.

Impacts from Management Specific to Alternative V

Prescribed fire would be allowed under Alternative V. Impacts would be the same type as those described in the No Action Alternative, except they would occur on fewer acres. Vegetation treatments that may include prescribed fire include 41,000 acres of Annual VSG.

All potential prescribed fires over the life of the plan would result in estimated emissions of 779 tons of $PM_{2.5}$ and 1,066 tons of PM_{10} (Table 4-7). Only Alternative I would produce fewer emissions than Alternative V due to prescribed fire.

Table 4-7. Total Particulate Matter Emissions from Prescribed Fire in Alternative V

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of $PM_{2.5}$ Emissions (tons/acre)	Total $PM_{2.5}$ Emissions (tons)	Rate of PM_{10} Emissions (tons/acre)	Total PM_{10} Emissions (tons)
Annual	41,000	0.019	779	0.026	1,066
Total	**41,000**		**779**		**1,066**

Mechanical vegetation treatments would potentially occur on 439,000 acres. Although Alternative V emphasizes passive restoration, for analysis purposes, the most impactive treatment, mechanical treatment, was assumed. Impacts would be the same as Alternative I but could occur over an estimated 62,000 more acres, most likely resulting in more particulate matter emission. Alternative V could mechanically treat more acres and would pose a greater risk for increased particulate matter than the No Action Alternative and Alternatives I, II, and III, but fewer acres than Alternatives IV and VI.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Prescribed fire would be allowed under Alternative VI. Impacts would be the same type as those described in the No Action Alternative except impacts would occur on more acres. Vegetation treatments that may include prescribed fire as a tool in each VSG include 57,000 acres of Annual and 107,000 acres of Non-Native Perennial.

All potential prescribed fires would result in estimated emissions of 2,153 tons of $PM_{2.5}$ and 2,873 tons of PM_{10} (Table 4-8). This would be less than the total emissions for Alternative IV, but more than the total emissions for the No Action Alternative and Alternatives I, II, III, and V due to prescribed fire.

Table 4-8. Total Particulate Matter Emissions from Prescribed Fire in Alternative VI (Proposed RMP)

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of $PM_{2.5}$ Emissions (tons/acre)	Total $PM_{2.5}$ Emissions (tons)	Rate of PM_{10} Emissions (tons/acre)	Total PM_{10} Emissions (tons)
Annual	57,000	0.019	1,083	0.026	1,482
Non-Native Perennial	107,000	0.010	1,070	0.013	1,391
Total	**164,000**		**2,153**		**2,873**

Mechanical vegetation treatments would occur on up to 544,000 acres. Impacts would be the same as Alternative I but would occur over an estimated 167,000 more acres, most likely resulting in more particulate matter emission. Alternative VI would mechanically treat more acres and would pose a greater risk for increased particulate matter than the No Action Alternative and Alternatives I, II, III, and V; but fewer acres than Alternative IV.

Impacts from Wildland Fire Ecology and Management Actions

Fuels or emergency stabilization and burned area rehabilitation (ES&BAR) treatments that generate particulate matter impact air quality. Impacts to air quality from fuels and ES&BAR treatments utilizing surface-disturbing mechanical treatments have been included in the analysis under *Impacts from Upland Vegetation Actions*.

Wildland fires produce smoke, which is a source of particulate matter. Following wildland fires there is an increased potential or particulate matter to be generated from wind erosion of the disturbed ash and soil. Impacts to air quality from wildland fire smoke would be directly related to the size and frequency of wildland fire. Most vegetation types within the planning area have experienced a shorter fire return interval than expected compared to the historic fire regime. Alternatives that increase the number of acres of successional class (S-Class) similarity would result in a return to historic fire return intervals, which would generally be longer than the current trend. As acres achieve S-Class similarity, the potential for

frequent and large wildland fires decreases, which would result in less wildland fire smoke and fewer impacts to air quality. Table 4-9 depicts S-Class similarity by alternative.

Table 4-9. Successional Class Similarity by Alternative (Acres)

	Alternative						
	No Action	**I**	**II**	**III**	**IV**	**V**	**VI**
S-Class Similarity	498,000	861,000	498,000	684,000	910,000	731,000	862,000

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would achieve S-Class similarity on 498,000 acres. This alternative provides the baseline S-Class similarity for comparison of the action alternatives. As acres of S-Class Similarity increases, the potential for large and frequent wildland fires decreases. The trend of higher wildland fire frequency and larger wildland fires would continue, and particulate matter from smoke and wind erosion would continue.

Impacts from Management Common to All Action Alternatives

The planning area would not be available for Wildland Fire Use in any of the action alternatives; therefore, there would be no impacts from particulate matter produced through Wildland Fire Use.

Impacts from Management Specific to Alternatives I, III, IV, V, and VI (Proposed RMP)

Alternatives I, III, IV, V, and VI would achieve S-Class similarity greater than the baseline of 498,000 acres. These alternatives would potentially produce less particulate matter from wildland fire smoke and wind erosion than the No Action Alternative. Alternative IV would achieve the greatest acres in S-Class similarity at 910,000 acres.

Impacts from Management Specific to Alternative II

Alternative II would achieve S-Class similarity on 498,000 acres. Therefore, Alternative II would potentially produce the same particulate matter from wildland fire smoke and wind erosion as the No Action Alternative.

Impacts from Transportation and Travel Actions

Vehicle use on unpaved roads and trails generates fugitive dust and particulate matter in the air. Areas designated as open to cross-country motorized vehicle use also result in increased fugitive dust and particulate matter. Wind erosion in these areas may increase the amount of particulate matter. These impacts would be localized and short-lived. Along roads and designated routes, impacts would be spatially limited to approximately 164 feet from the routes (Padgett et al., 2007). These impacts would be localized to the route and would be short-lived.

Table 4-10 displays the travel designations by alternatives, including those areas where wind erosion is rated severe or very severe.

Table 4-10. Travel Designations by Alternative (Acres)

Travel Designation	Alternative						
	No Action	**I**	**II**	**III**	**IV**	**V**	**VI**
Open to Cross-Country Motorized Vehicle Use	342,000	4,000	0	4,000	4,000	1,000	4,000
Open to Cross-Country Motorized Vehicle Use in Severe or Very Severe Wind Erosion Class	92,000	1,000	0	1,000	1,000	200	1,000

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Limited to Designated Routes	966,000	1,253,000	1,309,000	1,304,000	1,269,000	1,204,000	1,304,000
Limited to Designated Routes Use in Severe or Very Severe Wind Erosion Class	126,000	215,000	217,000	216,000	210,000	210,000	216,000
Closed to Motorized and/or Mechanized Vehicles	63,000	114,000	62,000	63,000	98,000	166,000	63,000

Impacts from Management Specific to the No Action Alternative

The planning area within Twin Falls, Elmore, and Elko Counties would continue to be open to cross-country motorized vehicle use; travel in Owyhee County will be managed pursuant to the Owyhee Front Travel Management Plan. Particulate matter would be generated from cross-country motorized vehicle use on 342,000 acres; however, impacts would be dispersed and short-term. Particulate matter would be most noticeable in popular cross-country riding areas, such as the 3,000-acre Hagerman-Owsley Bridge Special Recreation Management Area (SRMA). The potential for air quality impacts from particulate matter generated from wind erosion in areas open to cross-country motorized vehicle use is directly related to the amount of those areas that is in a severe or very severe wind erosion class. This alternative would have 92,000 acres open to cross-country motorized vehicle use in areas susceptible to severe or very severe wind erosion, the most of all alternatives.

Particulate matter would be generated from motorized vehicle use on 966,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 126,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Impacts from Management Specific to Alternative I

The Deadman/Yahoo SRMA, where 4,000 acres would be open to cross county motorized vehicle use, would experience relatively concentrated generation of particulate matter from motorized recreation activities. This alternative would have 1,000 acres open to cross-country motorized vehicle use in areas susceptible to severe or very severe wind erosion, same as Alternatives III, IV, and VI, which is 91,000 acres less than the No Action Alternative.

Particulate matter would be generated from motorized vehicle use on 1,253,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 215,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Impacts from Management Specific to Alternative II

There are no areas within Alternative II that are open to cross county motorized vehicle use; no particulate matter would be generated from areas open to cross county motorized use, the least of all alternatives. Particulate matter would be generated from motorized vehicle use on 1,309,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 217,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Impacts from Management Specific to Alternative III

Impacts from areas open to cross-country motorized vehicle use would be the same as Alternative I.

Particulate matter would be generated from motorized vehicle use on 1,304,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 216,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Impacts from Management Specific to Alternative IV

Impacts from areas open to cross-country motorized vehicle use would be the same as Alternative I.

Particulate matter would be generated from motorized vehicle use on 1,269,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 210,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Impacts from Management Specific to Alternative V

The Deadman/Yahoo SRMA, where 1,000 acres would be open to cross county motorized vehicle use, would experience relatively concentrated generation of particulate matter from motorized recreation activities. This alternative would have 200 acres open to cross-country motorized vehicle use in areas susceptible to severe or very severe wind erosion, the second least of all alternatives.

Particulate matter would be generated from motorized vehicle use on 1,204,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 210,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The Deadman and Yahoo SRMAs, where 4,000 acres would be open to cross county motorized vehicle use, would experience relatively concentrated generation of particulate matter from motorized recreation activities. This alternative would have 1,000 acres open to cross-country motorized vehicle use in areas susceptible to severe or very severe wind erosion, same as Alternatives I, III, and IV, which is 91,000 acres less than the No Action Alternative.

Particulate matter would be generated from motorized vehicle use on 1,304,000 acres where travel is limited to designated routes; however, impacts would be most noticeable adjacent to and on established routes and roads. This alternative would have 216,000 acres where travel is limited to designated routes in areas susceptible to severe or very severe wind erosion.

Summary of Direct and Indirect Impacts

Air quality would be impacted by wildland fires, management activities that produce smoke (prescribed fires), and surface-disturbing activities that increase the potential for particulate matter. All action alternatives would result in fewer impacts to air quality than the No Action Alternative. This is primarily due to management actions that result in less wildland fire smoke or less particulate matter generated by motorized vehicles. These impacts, which would occur over the life of the plan, are summarized in Table 4-11. The impacts from a single treatment or action would likely not extend beyond a single prescribed fire burn period or significant wind event.

Table 4-11. Summary of Impacts to Air Quality by Alternative

	Alternative						
	No Action	**I**	**II**	**III**	**IV**	**V**	**VI**
Impacts from Upland Vegetation Actions							
Potential $PM_{2.5}$[A] Emissions from Prescribed Fire (tons)	1,711	0	1,820	1,812	2,860	779	2,153
Potential PM_{10}[A] Emissions from Prescribed Fire (tons)	2,139	0	2,440	2,435	3,822	1,066	2,873

	Alternative						
	No Action	I	II	III	IV	V	VI
Impacts from Upland Vegetation Actions							
Potential Mechanical Treatments with Surface Disturbance-Generated Particulate Matter (Acres)	98,000	377,000	100,000	308,000	623,000	439,000	544,000
Impacts from Wildland Fire Ecology and Management Actions							
Acres of Successional Class (S-Class) Similarity (Potential Particulate Matter from Wildland Fire--as acres increase, potential for large and frequent wildland fires decreases)	498,000	861,000	498,000	684,000	910,000	731,000	862,000
Unvegetated Fuel Breaks with Wind Erosion-Generated Particulate Matter (Acres)	0	0	0	19,000	0	0	0
Impacts from Transportation and Travel Actions							
Acres Open to Cross-Country Motorized Vehicle Use	342,000	4,000	0	4,000	4,000	1,000	4,000
Acres Open to Cross-Country Motorized Vehicle Use in Severe or Very Severe Wind Erosion Class	92,000	1,000	0	1,000	1,000	200	1,000

[A] Particulate matter with diameters of 2.5 microns or less or 10 microns or less, respectively.

Impacts to air quality for all alternatives would be short-term and would not be expected to result in non-attainment for the planning area. Particulate matter estimated for each alternative would be localized and the amount would not exceed National Ambient Air Quality Standards beyond a short-lived basis. Impacts to air quality from particulate matter generated by motorized vehicles in all alternatives would be negligible in exceeding long-term air quality standards. Impacts to air quality from surface-disturbing vegetation treatments would also be negligible toward exceeding long-term air quality standards, as these treatments generally result in the establishment of vegetation that reduces long-term wind erosion. Unvegetated fuel breaks identified in Alternative III may have minor localized impacts in the long term as these areas are managed to be void of vegetation and would be continuously susceptible to particulate matter generated by wind erosion.

Impacts from the No Action Alternative

The No Action Alternative would have the highest impact to air quality. This is due to the impact from particulate matter emitted by wildland fire. This alternative has the least management actions that would increase the acres of S-Class Similarity to reduce the frequency of large wildland fires; the current trend for wildland fire would continue. While this alternative has the least amount of acreage of mechanical treatments with surface disturbance, it has the largest amount of acreage open to cross-country motorized vehicle use.

Impacts from Alternative I

Alternative I would have the second lowest impact to air quality after Alternative V. Since there is no prescribed fire, there would be no particulate matter generated from that management activity. The increase in S-Class similarity would decrease the frequency of large wildland fires and the associated particulate matter. The acres open to cross-country motorized vehicle use is substantially less than the No Action Alternative; less particulate matter would be produced. Particulate matter generated from mechanical vegetation treatments would be seasonal and the level of generation would vary.

Impacts from Alternative II

Alternative II would have the third highest impact to air quality after the No Action Alternative and Alternative III. This is due to the impact from particulate matter emitted by wildland fire. This alternative has no management actions that would increase the acres of S-Class similarity to reduce the frequency of large wildland fires; the current trend for wildland fire would continue. While there are no areas open to cross-country motorized vehicles, this is off-set by the impact from prescribed fire which would also increase the amount of particulate matter. Particulate matter generated from mechanical vegetation treatments would be seasonal and the level of generation would vary.

Impacts from Alternative III

Alternative III would have the second highest impact to air quality after the No Action Alternative. This is due to the impact from particulate matter emitted by wildland fire. This alternative increases the acres of S-Class similarity and would reduce the frequency of large wildland fires, but less so than in Alternatives I, IV, V, and VI. The amount of prescribed fire would also add to the amount of particulate matter more than the No Action Alternative and Alternatives I and V, and less than Alternatives II, IV, and VI. This alternative is the only alternative which would generate particulate matter from fuel breaks; however, this minor impact would be localized. Particulate matter generated from mechanical vegetation treatments would be seasonal and the level of generation would vary.

Impacts from Alternative IV

Alternative IV would have the third least impact to air quality after Alternatives V and I. This is due to the largest increase in S-Class similarity, which would reduce the frequency of large wildland fires and associated particulate matter. Particulate matter generated from cross-country motorized vehicle activities would be greater than Alternatives II and V, equal to that of Alternatives I, III, and VI, and less than the No Action Alternative; but this would be off-set by the reduction in large wildland fires. This alternative would generate more particulate matter from prescribed fire and mechanical vegetation treatments than any other alternative.

Impacts from Alternative V

Alternative V would have the least impact to air quality. This is due to having less particulate matter from prescribed fire than the No Action Alternative and Alternatives II, III, IV, and VI and having less particulate matter from cross-country motorized vehicle activity than every alternative except Alternative II. More particulate matter would be generated from frequent large wildland fire than in the No Action Alternative and Alternatives II and III due to S-Class similarity, which would off-set the impacts from prescribed fire and cross-country motorized vehicle activity. Particulate matter generated from mechanical vegetation treatments would be seasonal and the level of generation would vary.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would have the fourth least impact to air quality. This is due to the second largest increase in S-Class similarity, which would reduce frequency of large wildland fires and associated particulate matter. The acres open to cross-country motorized vehicle use is substantially less than the No Action Alternative; less particulate matter would be produced. Particulate matter generated from mechanical vegetation treatments would be seasonal and the level of generation would vary.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area is the planning area. Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect soil resources:

- Population Growth,
- Wildland Fire Ecology and Management,
- Land Use Authorizations, and
- Land Tenure.

These actions are described in the *Introduction* to this chapter.

The planning area has a history of good air quality. Management actions have had a negligible impact to air quality within the planning area and surrounding region. No significant sources of non-particulate matter pollutants exist within the planning area. Sources of air pollutants from outside the area are generally urban areas. Due to the distance from sources of pollution and the effects of dispersion from atmospheric conditions, impacts to the planning area from outside sources are negligible. Future urban or commercial developments near the planning area that produce air pollutants could impact air quality.

Cumulative impacts to air quality would be expected from development associated with population growth in south-central Idaho and wildland and prescribed fire management on adjacent Federally managed lands. In south-central Idaho and northern Nevada, the population is expected to grow between 10% and 20% over the life of the plan, based on historical population growth rates. This growth will result in increased pressures on the environment, including air quality. Cumulative impacts include regional haze and air pollution from vehicle emissions, commercial and industrial operations, and increased human-caused fires.

Wildland fire smoke may result in exceeding National Ambient Air Quality Standards (NAAQS) for particulate matter. The seasonality of wildland fires creates the potential for wildland fires within the planning area contributing to regional haze from wildland fires throughout Idaho and surrounding States. Wildland fire management practices are specified in the land use plans for adjacent Federal lands managed by the BLM (Bruneau, Burley, Four Rivers, Shoshone, and Wells (NV) Field Offices) and the Forest Service (Sawtooth and Humboldt-Toiyabe National Forests). These Federal lands are managed to prevent wildland fires, and wildland fire suppression is emphasized in most areas. Wildland fire mitigation is also included in Wildfire Protection Plans for Elko, Elmore, Owyhee, and Twin Falls Counties for Federal, State, county, and private lands in and adjacent to the planning area.

The various construction activities on State or private land (e.g., wind and solar energy development) produce particulate matter. The main causes of short-term particulate matter emissions are soil disturbing activities (e.g., grading, bulldozing, trench digging, traveling on unpaved roads). Exhaust emissions from vehicular travel and emissions from equipment use would also occur.

Land tenure adjustments resulting in public land leaving Federal ownership would potentially impact air quality on public lands. Future uses of disposed lands are unknown and unpredictable, and impacts would depend on ownership and use of the land. However, it is likely, that lands leaving Federal ownership would be used similarly under private ownership and would not affect air quality.

Summary of Cumulative Impacts

Impacts to air quality from sources outside the planning area would be the same for all alternatives. None of the management actions in any alternative are expected to significantly contribute to regional air quality conditions. Particulate matter generated from management actions would not exceed the yearly standards for NAAQS within the planning area or contribute to exceeding NAAQS within the adjacent region, including nearby non-attainment areas or Class I Airsheds. All alternatives provide for aggressive suppression of wildland fires so impacts to regional air quality from wildland fire smoke would be mitigated to the extent practical. No impacts from management actions associated with any alternative would result in non-attainment of air quality standards.

4.3.1.2 Climate Change

It may be difficult to discern whether global climate change is already affecting resources, let alone the planning area. In most cases, there is more information about potential or projected effects of global climate change on resources. It is important to note that projected changes are likely to occur over several decades to a century. Therefore many of the projected changes associated with climate change described below may not be measurably discernible over the life of the plan.

Over the next 50 years, temperature is predicted to increase 0.5°F per decade, occurring across all seasons, but with greater increases in the summer. Annual precipitation levels are predicted to stay within the range of variability observed during the 20th Century, but for seasonal patterns of precipitation to change with a larger proportion of winter precipitation occurring as rain rather than snow.

These trends can lead to decreased springtime snowpack, earlier snowmelt, increased winter and early spring streamflow, reduced summer streamflows, and earlier peak streamflows (Karl et al., 2009). For aquatic species, scouring of streambeds could occur due to higher winter streamflows, in turn damaging spawning nests and washing away incubating eggs. Stress on aquatic species increases due to increased winter floods, decreased summer streamflow, increased stream temperatures and increased diseases and parasites that flourish in warmer water temperatures (Karl et al., 2009).

The uncertainty in the projections for future precipitation levels, particularly levels of summer precipitation, makes predicting changes in vegetation difficult. If summer precipitation levels remain the same or decrease, forested systems are expected to decline due to increased drought stress, increased probability of disturbance by insects or wildland fires, and reduced seedling survival (Mote et al., 1999); vegetation would shift from forests, woodlands, and shrublands to grasslands and deserts (Chambers and Pellant, 2008). However, if summer precipitation increases, forested ecosystems are expected to expand into areas currently dominated by grassland and shrub communities (Chambers and Pellant, 2008; Mote et al., 1999). Additionally, sagebrush habitats may decline sharply throughout the region and be replaced with grasslands. Increasing carbon dioxide (CO_2) concentrations also lead to preferential fertilization and growth of specific plant species, such as invaders like cheatgrass. Climate change may favor certain shrub species, both native and exotic. These and other differences among species could lead to changes in the composition of rangeland vegetation. The climate-driven dynamic of the fire cycle is likely to become the single most important feature controlling future plant distributions in arid lands (Ryan et al., 2008).

Climate change can fundamentally alter the behavior, spread, and harm caused by invasive plants and the effectiveness of control methods. It is expected to alter the distribution and spread of invasive plants but in largely unknown ways (Finch et al., 2012). Higher concentrations of CO_2 appear to benefit non-native grasses and weeds more so than native species. Warmer, wetter winters and dry summers may enhance the spread and dominance of noxious weeds and invasive plants (e.g. cheatgrass) (Allen-Diaz, 1996).

Changes in climate can influence the timing and length of seasons, which in turn can have a direct effect on wildlife and their habitat. This may include shifts in distribution, phenology, morphology, and physiology. For example, the distribution of big sagebrush, habitat for greater sage-grouse and pygmy rabbits, is expected to shift northward with an overall decrease in amount (Shafer et al., 2001). Because some sagebrush obligate and associate species are so tied to sagebrush, a decrease in amount of sagebrush habitat or loss of connectivity could also decrease these species. A warming climate could leave a species that has adapted to snowy environments at a disadvantage. Relationships between predators and their prey may change as species respond differently to changing climates. Changes in temperature and precipitation could alter plant productivity and insect productivity, thereby influencing survival of the young (Blomberg et al., 2012) and their recruitment into the population. Warming temperatures could expand the habitat and infectivity of disease-carrying insects.

Analysis Methods

Indicators

BLM actions can alter atmospheric greenhouse gas (GHG) levels in a number of ways including, but not limited to, the release of GHGs and the sequestration of GHGs in soil and biomass. This in turn will contribute to further manifestations of climate change. The assessment of climate changing pollutant emissions and climate change is in its formative phase; therefore, it is not yet possible to know with confidence the net impact to climate.

The following indicators were used for the analysis of impacts to climate change:

- **Amount of carbon dioxide equivalent (CO_2[e]) emissions-** Ongoing scientific research has identified the potential impacts on global climate resulting from increases in man-made GHG emissions, including methane (CH_4) and carbon dioxide (CO_2), and changes in biological carbon sequestration due to land management activities. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks contribute to a net warming effect of the atmosphere, primarily by limiting the amount of heat energy radiated by the earth back into space. Some of the GHGs associated with each alternative and their activities will be naturally sequestered, while the balance of those GHG emissions will accumulate in the atmosphere. Emissions of GHGs are presented using a common metric, CO_2 (e), which indicates the relative contribution of each GHG to global average radiative forcing on a Global Warming Potential weighted basis.
- **Amount of carbon sequestered-** Carbon sequestration is the process of capture and long-term storage of atmospheric CO_2. Large amounts of carbon are stored in soils and vegetation, which are natural carbon sinks. Increasing carbon fixation through photosynthesis, slowing down or reducing decomposition of organic matter, and changing land use practices can enhance carbon uptake in these natural sinks.

Methods and Assumptions

Impacts to climate from management in the *Upland Vegetation* and *Livestock Grazing,* sections of Chapter 2 were analyzed in detail. Management in the *Land Use Authorizations and Leasable Minerals* sections generate CO_2(e), but were not analyzed in detail because the impact did not vary measurably between alternatives. Impacts to climate from management in the *Wildland Fire Ecology and Management* would be the same as those analyzed above in the *Air Quality* section. Management from the remaining sections of Chapter 2 was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for climate change.

Climate change analyses are comprised of several factors, including GHG concentrations and land use management practices. Although any particular BLM action cannot be associated with specific climate-related environmental effects, BLM activities may contribute to climate change through the emission or sequestration of GHGs. Climate change analysis for the purpose of this document is limited to accounting and disclosing factors that may contribute to climate change, specifically factors that would affect the amount of GHG emissions.

For the purpose of this analysis, it is assumed the planning area contains two primary pools (sinks) of carbon: the carbon contained within any belowground reservoirs of oil and gas and the carbon produced within the planning area each year as accumulated vegetation biomass.

The carbon contained within belowground oil and gas reservoirs is assumed to have one of two fates over the course of the year:

- Remain in the belowground reservoir, or
- Removal from the belowground reservoir through oil and/or gas drilling and entering the atmosphere through combustion, primarily as CO_2, with lesser amounts as CH_4 (primarily due to venting) and nitrous oxide (N_2O; also due to combustion equipment).

The carbon produced each year as vegetation biomass is assumed to have one of three fates over the course of the year:

- Sequestration in the ecosystem, in the form of perennial plant biomass (e.g., roots, woody material) or soil organic carbon;
- Return to the atmosphere as CO_2, either through plant and animal respiration, decomposition of plant biomass, and through burning of plant material in wildland or prescribed fires; or

- Return to the atmosphere as CH_4, through fermentation as rotting biomass or from the digestive system of ruminant[2] animals (i.e., enteric fermentation).

This model of carbon fluxes is used only for analysis purposes to help discern whether and how any alternatives may affect GHG emissions; in reality, carbon fluxes in the planning area are much more complex, but there is no methodology to estimate every change to carbon fluxes that may result from management contained within the alternatives. This analysis focuses on whether actions contained within the alternatives would change the magnitude of any of these fluxes.

The method for calculating prescribed fire emissions uses CO_2 and CH_4 emission estimates for each vegetation sub-group (VSG) generated from the First Order Fire Effects Model (Lutes et al., 2012). The First Order Fire Effects Model generates CO_2 and CH_4 emissions in pounds per acre. These are then converted to million metric tons (Tg) of CO_2(e) per acre and multiplied by the number of acres that could potentially be treated by prescribed fire. The following assumptions were made to estimate CO_2(e):

- For the Annual VSG, the CO_2 factor is 3.39×10^{-7} Tg/ac and the CH_4 factor is 0 Tg/ac.
- For the Native Grassland VSG, the CO_2 factor is 9.52×10^{-7} Tg/ac and the CH_4 factor is 4.54×10^{-10} Tg/ac.
- For the Native Shrubland VSG, the CO_2 factor is 2.61×10^{-6} and the CH_4 factor is 2.27×10^{-9}.
- For the Non-Native Perennial VSG, the CO_2 factor is 1.02×10^{-6} and the CH_4 factor is 4.54×10^{-10}.
- For the Non-Native Understory VSG, the CO_2 factor is 2.61×10^{-6} and the CH_4 factor is 2.27×10^{-9}.

Management of rangelands can aid in the mitigation of rising atmospheric CO_2 concentrations via carbon storage in biomass and soil organic matter. The method for calculating carbon sequestration uses estimates of carbon content, both aboveground and belowground, for soil and vegetation similar to the planning area. This method multiplies the estimated total carbon for specific vegetation communities by the number of acres that vegetation community occupies in the planning area. The following assumptions were made to estimate total carbon in metric tons:

- Total carbon estimates for sagebrush, bunchgrass, and cheatgrass vegetation communities from Austreng (2012) were used, where sagebrush represents the Native Shrubland and Non-Native Understory VSGs, bunchgrass represents the Native Grassland and Non-Native Perennial VSGs, and cheatgrass represents the Annual VSG. Sagebrush is estimated to have 47.43 metric tons of carbon per acre, bunchgrass 35.69 metric tons of carbon per acre, and cheatgrass 25.01 metric tons of carbon per acre.
- Carbon sequestration estimates are based on vegetation treatments being successful and *Upland Vegetation* objectives being met over the life of the plan.

Given adequate estimates of domestic livestock forage consumption by alternative, an estimate of potential changes in CH_4 emissions due to enteric fermentation by livestock can be made. Enteric fermentation is microbial fermentation that takes place in the digestive system of ruminant animals such as cattle and sheep and produces CH_4 as a byproduct. Even though manure is also a source of CH_4, it was not quantified in this analysis, because CH_4 emissions from manure are smaller than enteric emissions when livestock are not part of confined animal operations (IPCC, 2006). Livestock grazing can also affect other factors that influence climate change, including soil organic carbon (Ingram et al., 2008), soil microbial communities (Radl et al., 2007), and dust (Neff et al., 2008). However, there are few studies on these interactions in the Great Basin; therefore, this analysis focuses solely on the production of CH_4 by enteric fermentation.

While wild ruminants such as deer, pronghorn, and elk also generate CH_4 emissions, these were not included in this analysis because the number of wild animals in the planning area under each alternative has not been quantified. In addition, the Intergovernmental Panel on Climate Change recommends that

[2] A ruminant animal is a mammal that digests plant-based food by softening it within the animal's first stomach, known as the rumen, then regurgitating the semi-digested material known as cud and chewing it again.

GHG inventories of enteric fermentation only consider emissions from animals under domestic management (IPCC, 2006).

The method for estimating CH_4 emissions from enteric fermentation in livestock uses the BLM's Greenhouse Gas Emissions for Rangeland Management Projects worksheet (BLM, 2012a). This method multiplies animal unit months (AUMs) by an emission factor to yield the total amount of CH_4 emissions from enteric fermentation in metric tons per year. This figure is then converted into metric tons CO_2(e). The following assumptions were used to estimate CH_4 and CO_2(e) emissions for each alternative:

- An AUM is defined as the amount of forage that a cow and her calf would consume during a 30-day period and is defined as 800 pounds of air-dried forage. Full implementation AUMs were used for the analysis.
- Sheep and cattle do not have the same enteric fermentation emission factors. From a forage consumption perspective, one cow is equivalent to 5.2 sheep. These 5.2 sheep produce about 20% less CH_4 than one cow (IPCC, 2006). However, because none of the alternatives would substantially change the relative proportion of sheep within the planning area and to illustrate the upper bounds of potential impacts, for the purposes of this analysis, calculations are made as if all livestock use is by cattle.

Direct and Indirect Impacts

Impacts from Upland Vegetation Actions

The following indicators were used for the analysis of impacts from Upland Vegetation actions to climate change:

- Amount of carbon dioxide equivalent (CO_2[e]) emissions and
- Amount of carbon sequestered.

Prescribed fire would have a direct impact on climate change. Prescribed fires produce smoke, which is a source of greenhouse gases (GHGs). CO_2(e) emissions due to burning of plant material would vary by alternative. Native Shrubland and Non-Native Understory vegetation sub-groups (VSGs) give off more GHG emissions when burned than the grass-dominated VSGs due to the presence of woody material. Table 4-12 depicts the estimate of GHG emitted into the atmosphere for each alternative in million metric tons (Tg) CO_2(e) over the life of the plan and an annual average.

Table 4-12. Greenhouse Gas Emissions from Prescribed Fire by Alternative (Tg CO_2[e])

	Alternative						
	No Action	I	II	III	IV	V	VI
Total	0.166	0	0.080	0.067	0.164	0.014	0.129
Average Annual	0.0083	0	0.004	0.00335	0.0082	0.0007	0.00645

[A] Over the life of the plan; estimated at 20 years.

Mechanical vegetation treatments would also affect the amount of carbon stored in woody material, roots, and soil organic matter. Native Shrubland and Non-Native Understory VSGs store more carbon than grass-dominated VSGs due to the presence of woody material. However, all VSGs in the planning area store the majority of carbon within the soil, not in the aboveground biomass. Vegetation treatments to meet Upland Vegetation objectives would alter vegetation communities and affect the amount of carbon sequestered. For example, restoration of the Annual VSG to Native Shrubland would increase carbon storage over time. Table 4-13 depicts the potential carbon storage of each alternative in million metric tons of carbon.

Table 4-13. Carbon Sequestration Potential for each Vegetation Sub-Group by Alternative (Tg Carbon)

VSG	Alternative							
	Baseline	No Action	I	II	III	IV	V	VI
Annual	3.12	3.00	1.96	1.14	1.36	1.14	2.11	1.71
Native Grassland	16.95	16.99	8.64	16.95	9.21	6.00	9.89	8.03
Native Shrubland	14.47	13.47	31.21	14.47	24.00	38.66	25.80	34.53
Non-Native Perennial	12.71	14.35	10.99	16.24	15.17	5.75	5.60	7.10
Non-Native Understory	2.85	1.90	1.66	1.95	2.80	6.26	12.28	4.79
Total	**50.10**	**49.71**	**54.46**	**50.75**	**52.54**	**57.81**	**55.68**	**56.16**

Carbon dioxide (CO_2) emissions due to plant respiration and decomposition are not expected to vary substantially between alternatives, as there is no evidence that *Upland Vegetation* actions would change the rates or total amounts of plant respiration and decomposition.

Impacts from Management Specific to the No Action Alternative

Prescribed fire would be allowed and would occur on potentially 98,000 acres. GHGs produced from prescribed fire would be emitted into the atmosphere (Table 4-14). The No Action Alternative would emit the most GHG of all the alternatives.

Table 4-14. Greenhouse Gas Emissions from Prescribed Fire for the No Action Alternative

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of CO_2(e) Emissions (Tg/acre)	Total CO_2(e) Emissions (Tg)
Annual	6,000	0.000000339	0.002
Non-Native Perennial	49,000	0.000001030	0.050
Non-Native Understory	21,000	0.000002650	0.056
Native Shrubland	22,000	0.000002650	0.058
Total	**98,000**		**0.166**

Vegetation treatments would potentially occur on 98,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 49.71 Tg carbon for the planning area, the lowest amount sequestered of all alternatives and below the current sequestration estimate of 50.1 Tg.

Impacts from Management Specific to Alternative I

Prescribed fire would not be allowed under Alternative I; therefore, no GHGs would be emitted through prescribed fire, resulting in the lowest GHG emission of all the alternatives.

Vegetation treatments would potentially occur on 377,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 54.46 Tg carbon for the planning area, an increase from the current sequestration estimate of 50.1 and the fourth highest of all alternatives.

Impacts from Management Specific to Alternative II

Prescribed fire would be allowed under Alternative II and would occur on potentially 100,000 acres. GHGs produced from prescribed fire would be emitted into the atmosphere (Table 4-15). Alternative II would emit the fourth lowest amount of GHG after Alternatives I, V, and III.

Table 4-15. Greenhouse Gas Emissions from Prescribed Fire for Alternative II

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of CO_2(e) Emissions (Tg/acre)	Total CO_2(e) Emissions (Tg)
Annual	80,000	0.000000339	0.027
Non-Native Understory	20,000	0.000002650	0.053
Total	**100,000**		**0.080**

Vegetation treatments would potentially occur on 100,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 50.75 Tg carbon for the planning area, a slight increase from the current sequestration estimate of 50.1 and the second least of all alternatives after the No Action Alternative.

Impacts from Management Specific to Alternative III

Prescribed fire would be allowed under Alternative III s and would occur on potentially 105,000 acres. GHGs produced from prescribed fire would be emitted into the atmosphere (Table 4-16). Alternative III would emit the third lowest GHG of all the alternatives after Alternatives I and V.

Table 4-16. Greenhouse Gas Emissions from Prescribed Fire for Alternative III

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of CO_2(e) Emissions (Tg/acre)	Total CO_2(e) Emissions (Tg)
Annual	72,000	0.000000339	0.024
Native Grassland	20,000	0.000000925	0.019
Non-Native Perennial	7,000	0.000001030	0.007
Non-Native Understory	2,000	0.000002650	0.005
Native Shrubland	4,000	0.000002650	0.011
Total	**105,000**		**0.067**

Vegetation treatments would potentially occur on 308,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 52.54 Tg carbon for the planning area, the third least of all alternatives.

Impacts from Management Specific to Alternative IV

Prescribed fire would be allowed under Alternative IV and would occur on potentially 214,000 acres. GHGs produced from prescribed fire would be emitted into the atmosphere (Table 4-17). Alternative IV would emit the second highest amount of GHGs after the No Action Alternative.

Table 4-17. Greenhouse Gas Emissions from Prescribed Fire for Alternative IV

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of CO_2(e) Emissions (Tg/acre)	Total CO_2(e) Emissions (Tg)
Annual	80,000	0.000000339	0.027
Non-Native Perennial	134,000	0.000001030	0.137
Total	**214,000**		**0.164**

Vegetation treatments would potentially occur on 623,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 57.81 Tg carbon for the planning area, an increase from the current sequestration estimate of 50.1 and the highest of all alternatives.

Impacts from Management Specific to Alternative V

Prescribed fire would be allowed under Alternative V and would occur on potentially 41,000 acres. GHGs produced from prescribed fire would be emitted into the atmosphere (Table 4-18). Alternative V would emit the second lowest amount of GHGs after Alternative I.

Table 4-18. Greenhouse Gas Emissions from Prescribed Fire for Alternative V

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of CO_2(e) Emissions (Tg/acre)	Total CO_2(e) Emissions (Tg)
Annual	41,000	0.000000339	0.014
Total	**41,000**		**0.014**

Vegetation treatments would potentially occur on 439,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 55.68 Tg carbon for the planning area, an increase from the current sequestration estimate of 50.1 and the third highest of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Prescribed fire would be allowed and would occur on potentially 164,000 acres. GHGs produced from prescribed fire would be emitted into the atmosphere (Table 4-19). Alternative VI would emit the third highest amount of GHGs after the No Action Alternative and Alternative IV.

Table 4-19. Greenhouse Gas Emissions from Prescribed Fire for Alternative VI (Proposed RMP)

VSG	Potential Prescribed Fire Acres over the Life of the Plan	Rate of CO_2(e) Emissions (Tg/acre)	Total CO_2(e) Emissions (Tg)
Annual	57,000	0.000000339	0.019
Non-Native Perennial	107,000	0.000001030	0.110
Total	**164,000**		**0.129**

Vegetation treatments would potentially occur on 544,000 acres and alter vegetation over the life of the plan. Carbon sequestration would be approximately 56.16 Tg carbon for the planning area, an increase from the current sequestration estimate of 50.1 and the second highest of all alternatives.

Impacts from Wildland Fire Ecology and Management Actions

The following indicator was used for the analysis of impacts from Wildland Fire Ecology and Management actions to climate change:

- Amount of carbon dioxide equivalent (CO_2[e]) emissions.

Although Wildland Fire Ecology and Management actions affect annual carbon emissions, the amount of carbon returned to the atmosphere as carbon dioxide (CO_2) each year through consumption of plant material in wildland fires for each alternative is speculative because wildland fires vary widely from year to year. Increased fire size or departure from historic fire regimes could decrease the amount of carbon stored as plant or soil biomass by increasing the likelihood a given acre would burn in a particular year. However, decreased fire return intervals would also allow less biomass to accumulate between wildland fires, reducing the amount of CO_2 released in a fire.

Impacts from Livestock Grazing Actions

The following indicator was used for the analysis of impacts from Livestock Grazing actions to climate change:

- Amount of carbon dioxide equivalent (CO_2[e]) emissions.

Livestock grazing actions affect the amount of methane (CH_4) emissions due to enteric fermentation.

Ruminant animals, including domestic cattle and sheep, produce CH_4 as a by-product of their normal digestive processes (i.e., enteric fermentation). The total amount of CH_4 emitted by livestock is related to many factors, including the kind and number of livestock, the type of production system, and the quantity and quality of feed (Steinfeld et al., 2006).

Table 4-20 displays the effects of the allocations of vegetation production to livestock on emission of CO_2(e) produced through enteric fermentation.

Table 4-20. Greenhouse Gas Emissions through Enteric Fermentation by Alternative (Metric Tons CO_2[e] per Year)

AUM Estimate	Baseline	Alternative							
		No Action	I	II	III	IV		V	VI
						IV-A	IV-B		
Low	710	568	636	1,284	979	276	287	150	661
High		923	871	1,561	1,235	435	452	300	913

[A] Greenhouse gas (GHG) emission estimations are based on animal unit month (AUM) allocation ranges for livestock grazing by alternative, which are based on 2011 vegetation production data. The AUM estimates are also based on the amount of vegetation available after upland vegetation objectives have been reached. Baseline emissions are based on the current AUM level of 200,000.

Impacts from Management Specific to the No Action Alternative

Enteric fermentation from livestock in the No Action Alternative would result in between 568 and 923 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, the No Action Alternative would decrease GHG emissions from cattle at the low AUM estimate and increase GHG emissions at the high AUM estimate. On average, the No Action Alternative is very similar to Alternatives I and VI. The No Action Alternative would emit the third least amount of GHGs, about half the emissions of Alternative II, but three times the amount of Alternative V.

Impacts from Management Specific to Alternative I

Enteric fermentation from livestock in Alternative I would result in between 636 and 871 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, Alternative I would decrease GHG emissions from cattle at the low AUM estimate and increase GHG emissions at the high AUM estimate. On average, Alternative I is very similar to the No Action Alternative and Alternative VI. Alternative I would emit the fourth least amount of GHGs, about half the emissions of Alternative II, but three times the amount of Alternative V.

Impacts from Management Specific to Alternative II

Enteric fermentation from livestock Alternative II would result in between 1,284 and 1,561 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, Alternative II would increase GHG emissions from cattle at both the low and high AUM levels. This alternative would have the highest GHG emission from cattle of all the alternatives. On average, Alternative II would emit the most amount of GHGs of all the alternatives, about six times the amount of Alternative V.

Impacts from Management Specific to Alternative III

Enteric fermentation from livestock in Alternative III would result in between 979 and 1,235 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, Alternative III would increase GHG emissions from cattle at both the low and high AUM levels. On average, Alternative III would emit the second most amount of GHGs after Alternative II, about five times the amount of Alternative V.

Impacts from Management Specific to Alternative IV

Enteric fermentation from livestock in Alternatives IV-A and IV-B would result in between 276 and 452 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, Alternative IV, either A or B, would decrease GHG emissions at both the low and high AUM levels. On

average, Alternative IV would emit the second least amount of GHGs, about a quarter the emissions of Alternative II, but one and a half times the amount of Alternative V.

Impacts from Management Specific to Alternative V

Enteric fermentation from livestock in Alternative V would result in between 150 and 300 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, Alternative V would decrease GHG emissions at both the low and high AUM levels. This alternative would have the lowest GHG emissions from cattle of all alternatives. On average, Alternative V would emit the least amount of GHGs of all the alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Enteric fermentation from livestock in Alternative VI would result in between 661 and 991 metric tons of CO_2(e) per year. Compared to the current level of 710 metric tons of CO_2(e) per year, Alternative VI would decrease GHG emissions at the low AUM level and increase them at the high AUM level. On average, Alternative VI is similar to the No Action Alternative and Alternative I. Alternative VI would emit the third most amount of GHGs, about half the emissions of Alternative II, but three times the amount of Alternative V.

Impacts from Land Use Authorization Actions

The following indicator was used for the analysis of impacts from Land Use Authorizations actions to climate change:

- Amount of carbon dioxide equivalent (CO_2[e]) emissions.

Land Use Authorization actions, such as wind energy development or transmission line construction, would affect global atmospheric greenhouse gases (GHGs). During the construction phase, GHG emissions result from activities including vehicle emissions; diesel emissions from large construction equipment and generators; volatile organic compound releases from storage and transfer of vehicle/equipment fuels, small amounts of carbon monoxide, nitrogen oxides, and particulates from blasting activities, and fugitive dust.

During the operation phase, wind energy produces zero direct GHG emissions in the generation process. Wind energy does not directly reduce GHGs but displaces fossil fuel-fired generation that emits GHGs. Therefore, wind energy reduces fossil fuel combustion at existing power plants or reduces the need to build and operate new fossil fueled power plants (Jacobson and High, 2008). Minor volatile organic compound emissions are possible during routine maintenance activities of applying lubricants, cooling fluids, and greases. Minor amounts of carbon monoxide and nitrogen oxides would be produced during periodic operation of diesel emergency generators as part of preventative maintenance. Vehicular traffic would continue to produce small amounts of fugitive dust and tailpipe emissions.

Impacts from Leasable Minerals Actions

The following indicator was used for the analysis of impacts from Leasable Mineral actions to climate change:

- Amount of carbon dioxide equivalent (CO_2[e]) emissions.

Although Leasable Minerals actions could affect annual greenhouse gas (GHG) emissions, the potential for oil and gas discovery and development in the planning area is low (see Appendix K). In addition, potential GHG emissions under the Reasonably Foreseeable Development Scenario (RFDS) cannot be quantified as the RFDS does not estimate potential production of oil or gas by volume. Thus, even though the alternatives vary in the acreage available for mineral leasing, the likelihood that any of the alternatives will result in a shift of carbon from those long-term carbon sinks to the atmosphere is low.

Summary of Direct and Indirect Impacts

Table 4-21. Net CO_2(e) Emissions/Sequestration per Alternative Over the Life of the Plan (Million Metric Tons [Tg])

Indicator	Alternative						
	No Action	I	II	III	IV	V	VI
CO_2(e) Emissions from Livestock Grazing [A]	0.018	0.017	0.031	0.025	0.009	0.006	0.020
CO_2(e) Emissions from Prescribed Fire	0.166	0	0.080	0.067	0.164	.0140	0.129
C sequestered in soil and biomass	49.71	54.46	50.75	52.54	57.81	55.68	56.16

[A] Livestock grazing converted from metric tons to Tg to be consistent with prescribed fire emissions and carbon sequestration, then multiplied by 20 to yield greenhouse gas (GHG) over the life of the plan.

Overall, all alternatives have management that contribute GHGs back into the atmosphere, but would be sequestered into soil and biomass (Table 4-21).

Impacts from the No Action Alternative

The No Action Alternative would result in the highest amount of total GHG emissions and the lowest amount of potential carbon sequestration.

Impacts from Alternative I

Alternative I would result in the least amount of total GHG emissions of all the alternatives and the fourth highest amount of potential carbon sequestration.

Impacts from Alternative II

Alternative II would result in the second least amount of total GHG emissions and the sixth highest amount of potential carbon sequestration.

Impacts from Alternative III

Alternative III would result in the fourth least amount of total GHG emissions and the fifth highest amount of potential carbon sequestration.

Impacts from Alternative IV

Alternative IV would result in the second highest amount of total GHG emissions, but the highest amount of potential carbon sequestration.

Impacts from Alternative V

Alternative V would result in the third lowest amount of total GHG emissions and the third highest amount of potential carbon sequestration.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would result in the third highest amount of total GHG emissions and the second highest amount of carbon sequestration potential.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect climate change:

- Livestock Grazing and
- Upland Vegetation.

These actions are described in the *Introduction* to this chapter.

Because the scope of the causes and effects of climate change is global, the cumulative impacts analysis area includes changes to factors affecting greenhouse gas (GHG) emissions from enteric fermentation and prescribed fire across the globe. The cumulative impacts analysis considers cumulative impacts of the alternatives on GHG emissions measured in carbon dioxide equivalent (CO_2[e]). In addition to considering cumulative impacts to GHG emissions at the global scale, the analysis also considers these impacts at the national and State scales as impacts to GHG emissions from the alternatives can be put into better context at these smaller scales.

Past, present, and reasonably foreseeable actions in Idaho, the United States, and across the globe that affect GHG emissions from enteric fermentation include methane (CH_4) emitted from livestock outside the planning area, including livestock that graze on other BLM-managed lands, other Federal lands, State lands, and private lands. Emission estimates for 2010 are used in this analysis for the national and State levels. CH_4 emissions from enteric fermentation in Idaho were projected to be 3.52 million metric tons (Tg) of CO_2(e) in 2010 (Strait et al., 2008), while emissions from enteric fermentation in the United States the same year were 141.3 Tg of CO_2(e) (EPA, 2012b). The average annual global emissions from ruminants between 1990 and 2000 contained in the Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change is used for the analysis at the global scale (Denman et al., 2007); the estimate of CH_4 emissions from enteric fermentation across the globe is 1,732.5 Tg of CO_2(e) (Denman et al., 2007). For the purposes of analysis, it is assumed these emission rates will remain constant over the life of the plan.

Past, present, and reasonably foreseeable actions in Idaho, the United States, and across the globe that affect GHG emissions from prescribed fire include CO_2(e) emitted from burning activities outside the planning area, including prescribed fire on other BLM-managed lands, other Federal lands, State lands, and private lands. Emission estimates for the State of Idaho are not precise, Strait and others (2008) state that fires contribute on the order of 0.3 to 1.3 Tg CO_2(e) annually in Idaho. Assuming an average of 0.8 Tg CO_2(e) per year, and that prescribed fire contributes approximately 15% of those emissions, the State estimate for prescribed fire would be 0.12 Tg CO_2(e) annually. Emissions from prescribed fire in the United States averaged 21.5 Tg of CO_2(e) from 2005 to 2010 (EPA, 2012b). Global emissions from prescribed fire are not available, but global emissions from biomass burning averaged 7,334 Tg of CO_2(e) between 1997 and 2009 (Van der Werf et al., 2010). For the purposes of analysis, it is assumed that these emission rates will remain constant over the life of the plan.

To assess cumulative impacts, it is assumed that the Tg of CO_2(e) for the No Action Alternative are already incorporated into the global, national, and State estimates. The analysis calculates how the global, national, and State estimates would change under each alternative and what percent of the total GHG emissions would be within the planning area. The high end of the estimates of Tg of CO_2(e) is used for this analysis in order to display the maximum estimate of how the alternatives may cumulatively affect GHG emissions.

Summary of Cumulative Impacts

Table 4-22 and Table 4-23 display cumulative amounts of greenhouse gas (GHG) emissions through enteric fermentation and prescribed fire by alternative.

Table 4-22. Cumulative Impacts of Greenhouse Gas Emissions from Enteric Fermentation from Livestock by Alternative (Million Metric Tons [Tg] of Carbon Dioxide Equivalent [CO_2{e}] per Year)

	Alternative						
	No Action	I	II	III	IV	V	VI
Planning Area Total	0.000923	0.000871	0.001561	0.001235	0.000452	0.000300	0.000913
State of Idaho							
Total	3.5200[A]	3.5199	3.5206	3.5203	3.5195	3.5193	3.5200
% Due to Emissions in the Planning Area	0.03	0.02	0.04	0.03	0.01	0.008	0.03
United States							
Total	141.3[B]	141.299	141.30	141.30	141.299	141.299	141.3

	Alternative						
	No Action	I	II	III	IV	V	VI
United States							
% Due to Emissions in the Planning Area	0.0007	0.0006	0.001	0.0009	0.0003	0.0002	0.0007
Global							
Total	1,732.5[C]	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5	1,732.5
% Due to Emissions in the Planning Area	0.00005	0.00004	0.00008	0.00002	0.00002	0.00001	0.00005

[A] Tg of CO_2(e) emitted in the State of Idaho in 2010; it is assumed that this figure includes emissions from the planning area for the No Action Alternative.
[B] Tg of CO_2(e) emitted in the United States in 2010; it is assumed that this figure includes emissions from the planning area for the No Action Alternative.
[C] Tg of CO_2(e) emitted each year globally between 1990 and 2000; it is assumed that this figure includes emissions from the planning area for the No Action Alternative.

Table 4-23. Cumulative Impacts of Greenhouse Gas Emissions from Prescribed Fire by Alternative (Tg of CO_2[e] per Year)

	Alternative						
	No Action	I	II	III	IV	V	VI
Planning Area Total [A]	0.0085	0	0.004	0.0035	0.008	0.007	0.0065
State of Idaho							
Total	0.12[B]	0.12	0.12	0.12	0.12	0.12	0.12
% Due to Emissions in the Planning Area	7.0	0	3.3	2.9	6.7	5.8	5.4
United States							
Total	21.4985[C]	21.4900	21.4940	21.4935	21.498	21.497	21.4965
% Due to Emissions in the Planning Area	0.04	0	0.02	0.02	0.04	0.03	0.03
Global							
Total	7,334[D]	7,334	7,334	7,334	7,334	7,334	7,334
% Due to Emissions in the Planning Area	0.00011	0	0.00005	0.00004	0.00010	0.00009	0.00008

[A] Total Tg of CO_2(e) emitted from prescribed fire divided by 20 years (estimated life of the plan) to yield emissions on an annual basis.
[B] Estimated Tg of CO_2(e) emitted in the State of Idaho; wildland fire and prescribed fire emit an average between 0.3 to 1.3 Tg of Co_2(e) per year. It is assumed this figure includes emissions from the planning area for the No Action Alternative.
[C] Average Tg of CO_2(e) emitted from prescribed fire in the United States from 2005 to 2010; it is assumed that this figure includes emissions from the planning area for the No Action Alternative.
[D] Average Tg of CO_2(e) emitted each year globally from fires between 1997 and 2009; it is assumed that this figure includes emissions from the planning area for the No Action Alternative.

Cumulative Impacts from the No Action Alternative

In the No Action Alternative, GHG emissions through enteric fermentation would remain at current levels. Emissions from livestock based in the planning area account for 0.03% of the State total, 0.007% of the national total, and 0.00005% of the global total.

GHG emissions from prescribed fire account for 7.0% of the State total, 0.04% of the national total, and 0.00011% of the global total.

The No Action Alternative would have the highest impact to climate change from GHG emissions.

Cumulative Impacts from Alternative I

In Alternative I, GHG emissions through enteric fermentation would decrease slightly compared to current levels. Emissions from livestock based in the planning area would still account for only 0.02% of the State total, 0.0006% of the national total, and 0.00004% of the global total.

Prescribed fire would not be allowed under Alternative I; therefore, no GHGs would be emitted into the atmosphere through prescribed fire, resulting in the lowest GHG emission of all the alternatives. No impacts to climate change from prescribed fire would occur.

Alternative I would have the least cumulative impact on climate change from GHG emissions.

Cumulative Impacts from Alternative II

In Alternative II, GHG emissions through enteric fermentation would increase slightly compared to current levels. Emissions from livestock based in the planning area would increase slightly to 0.04% of the State total, 0.001% of the national total, and 0.00008% of the global total.

GHG emissions from prescribed fire would decrease from current levels and would account for 3.3% of the State total, 0.02% of the national total, and 0.00005% of the global total.

Alternative II would have the third least cumulative impact to climate change from GHG emissions.

Cumulative Impacts from Alternative III

In Alternative III, GHG emissions through enteric fermentation would increase slightly compared to current levels. Emissions from livestock based in the planning area would increase slightly to 0.03% of the State total, 0.009% of the national total, and 0.00002% of the global total.

GHG emissions from prescribed fire account for 2.9% of the State total, 0.02% of the national total, and 0.00004% of the global total.

Alternative III would have the second least cumulative impact to climate change from GHG emissions.

Cumulative Impacts from Alternative IV

In Alternative IV, GHG emissions through enteric fermentation would decrease slightly compared to current levels. Emissions from livestock based in the planning area would decrease slightly to 0.01% of the State total, 0.003% of the national total, and 0.00002% of the global total.

GHG emissions from prescribed fire would decrease slightly from current levels and would account for 6.7% of the State total, 0.04% of the national total, and 0.0001% of the global total.

Alternative IV would have the second highest cumulative impact to climate change from GHG emissions.

Cumulative Impacts from Alternative V

In Alternative V, GHG emissions through enteric fermentation would decrease compared to current levels. Emissions from livestock based in the planning area would decrease to 0.008% of the State total, 0.0002% of the national total, and 0.00001% of the global total.

GHG emissions from prescribed fire would decrease slightly from current levels and would account for 5.8% of the State total, 0.03% of the national total, and 0.0009% of the global total.

Alternative V would have the third highest cumulative impact to climate change from GHG emissions.

Cumulative Impacts from Alternative VI (Proposed RMP)

In Alternative VI, GHG emissions through enteric fermentation would slightly increase compared to current levels. Emissions from livestock based in the planning area would increase to 0.03% of the State total, 0.0007% of the national total, and 0.00005% of the global total.

GHG emissions from prescribed fire would decrease slightly from current levels and would account for 5.4% of the State total, 0.03% of the national total, and 0.0008% of the global total.

Alternative VI would have the fourth least cumulative impact to climate change from GHG emissions.

4.3.2. Geologic Features

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to geologic features:

- **Alterations to geologic features** – Alterations to geologic features would include complete or partial removal, relocation, defacement, or changes to the structure of unique geologic features such as canyon walls, hoodoos, pinnacles, columns, arches, overhangs, cave entrances, and cave tunnels within the planning area. There is no severity threshold for these changes. Geologic features are either maintained or experience a decrease in value if any alteration is realized. Maintenance implies the absence of alterations.

Methods and Assumptions

Impacts to geologic features from management in the following sections of Chapter 2 were analyzed in detail: *Geologic Features*, *Lands with Wilderness Characteristics*, *Minerals (Salable and Locatable),* and *Special Designations (Areas of Critical Environmental Concern*, *Wild and Scenic Rivers*, and *Wilderness Study Areas)*. Only areas with geologic features located outside the Bruneau-Jarbidge Rivers Wilderness are analyzed since wilderness management provides the same level of protection under all alternatives. Impacts from management actions that would affect the Glenns Ferry Formation are analyzed in the *Paleontological Resources* section. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for geologic features.

The geologic features included in this analysis are the canyon complexes associated with the Bruneau River, Jarbidge River and its East Fork, Buck Creek, and Lower Salmon Falls Creek. The entrances to known caves are also included. These identified areas total 33,000 acres. Of these, only the 12,000 acres of geologic features that occur outside the Bruneau-Jarbidge Rivers Wilderness are analyzed. Management of the other 21,000 acres does not vary by alternative.

Impacts to geologic features were quantified through a geographic information system analysis of the various allocations in the alternatives. Management that allows surface-disturbing activities that would change or eliminate any of these geologic features would be considered to decrease the value of this resource. Likewise, management that restricts surface-disturbing activities will maintain these values.

Direct and Indirect Impacts

Impacts from Geologic Features Actions

Impacts from Management Specific to the No Action Alternative

The No Action Alternative manages geologic resources so that they are protected, maintained, or enhanced. This would maintain these resources.

Impacts from Management Common to All Action Alternatives

All action alternatives would protect unique geologic features. This would maintain these resources.

Impacts from Lands with Wilderness Characteristics Actions

Five of the eighteen areas identified as Lands with Wilderness Characteristics also contain land with geologic features, totaling 5,200 acres Table 4-24). The areas with these formations are Long Draw, Hole-in-the-Ground, East Fork Jarbidge, Robeson Trail, and Twin Lakes. Management to maintain

wilderness characteristics in these areas would also maintain geologic features. Alterations to geologic features would be more likely to occur on these lands if they are not managed to maintain existing wilderness characteristic.

Table 4-24. Acres Containing Geologic Features within Lands Managed for Wilderness Characteristics

Lands with Wilderness Characteristics	Alternative						
	No Action	I	II	III	IV	V	VI
Long Draw	0	2,200	0	0	0	2,200	0
Hole-in-the-Ground	0	1,200	0	0	0	1,200	0
East Fork Jarbidge	0	1,600	0	0	0	1,600	0
Robeson Trail	0	0	0	0	0	100	0
Twin Lakes	0	0	0	0	0	100	0
Total	**0**	**5,000**	**0**	**0**	**0**	**5,200**	**0**

Impacts from Management Specific to the No Action Alternative and Alternatives II, III, IV, and VI (Proposed RMP)

These alternatives do not manage Lands with Wilderness Characteristics to maintain wilderness character, or, in the case of Alternative IV, the identified Lands with Wilderness Characteristics do not overlap with areas containing special geologic features. The existing geologic features, as a component of naturalness, would not have protection from alterations in these alternatives because the lands would not be managed to preserve naturalness. Alterations would result in a decrease in value of geologic features.

Impacts from Management Specific to Alternative I

Portions of the Long Draw, Hole-in-the-Ground, and East Fork Jarbidge areas would be managed to maintain the existing wilderness characteristics. This would not allow for alterations to the identified geologic features that occur in these areas. This would maintain these geologic features because these lands would be managed to preserve their naturalness. Alterations to geologic features could occur within the Robeson Trail and Twin Lakes areas; alterations in these areas would decrease the value of geologic features.

Impacts from Management Specific to Alternative V

Portions of Long Draw, Hole-in-the-Ground, East Fork Jarbidge, Robeson Trail, and Twin Lakes areas would be managed to maintain the existing wilderness characteristics. This would not allow for alterations to the identified geologic features that occur in these areas. This would maintain these geologic features because these lands would be managed to preserve their naturalness.

Impacts from Minerals Actions

Salable and locatable mineral developments have the potential to alter geologic features through mining-related construction and extraction activities. For this analysis, areas open to salable mineral development and available for locatable mineral development are compared to the lands containing geologic features (Table 4-25).

Table 4-25. Salable and Locatable Mineral Allocations within Lands Containing Geologic Features by Alternative (Acres)

Mineral Allocation	Alternative						
	No Action	I	II	III	IV	V	VI
Salable Minerals (Open)	10,000	1,000	11,000	4,000	100	1,000	2,000
Locatable Minerals (Available)	600	1,000	4,000	4,000	200	4,000	12,000

Impacts from Management Specific to the No Action Alternative

Approximately 83% of the lands with geologic features would be open to salable mineral development under the No Action Alternative. This is second only to Alternative II. In contrast, only 5% of lands with geologic features would be available for locatable mineral development. Only Alternative IV would make fewer acres available for this type of use. Salable and locatable mineral development would alter geologic features through the removal, relocation, or defacement of rock structures.

Impacts from Management Specific to Alternative I

Alternative I would make 8% of lands with geologic features open to salable mineral development and 8% available for locatable mineral development. The potential for alterations to geologic features from mineral development under this alternative is less than the No Action Alternative and Alternatives II, III, V, and VI, but more than Alternative IV.

Impacts from Management Specific to Alternative II

Alternative II would make 92% of lands with geologic features open to salable mineral development and 33% available for locatable mineral development. This alternative has more potential for alterations to geologic features from mineral development than any of the alternatives.

Impacts from Management Specific to Alternative III

Alternative III would make 33% of lands with geologic features open to salable mineral development and 33% available for locatable mineral development. This alternative has more potential for alterations to geologic features from salable mineral development than Alternatives I, IV, V, and VI, but less than the No Action Alternative and Alternative II. The potential for alterations to geologic features from locatable mineral development under Alternative III would be more than the No Action Alternative and Alternatives I and IV; the same as Alternatives II and V; and less than Alternative VI.

Impacts from Management Specific to Alternative IV

Alternative IV would make 1% of lands with geologic features open to salable mineral development and 2% available for locatable mineral development. This alternative has less potential for alterations to geologic features from mineral development than any of the alternatives.

Impacts from Management Specific to Alternative V

Alternative V would make 8% of lands with geologic features open to salable mineral development and 33% available for locatable mineral development. This alternative has more potential for alterations to geologic features from salable mineral development than Alternative IV; the same as Alternative I; and less than the No Action Alternative and Alternatives II, III, and VI. The potential for alterations to geologic features from locatable mineral development under Alternative V would be more than the No Action Alternative and Alternatives I and IV; the same as Alternatives II and III; and less than Alternative VI.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would make 17% of lands with geologic features open to salable mineral development and 100% available for locatable mineral development. This alternative has more potential for alterations to geologic features from salable mineral development than Alternatives I, VI, and V, but less than the No Action Alternative and Alternatives II and III. The potential for alterations to geologic features from locatable mineral development under Alternative VI would be more than any of the alternatives.

Impacts from Special Designation Actions

Area of Critical Environmental Concern (ACEC), Wilderness Study Area (WSA), and Wild and Scenic River (WSR) management would be complementary to the conservation of geologic features. Areas with geologic features and special designation management will be less likely to experience a decrease in value or loss of resources than areas without this management. This portion of the analysis focuses on ACECs, the WSA, and WSR corridors (Table 4-26) containing geologic features. As noted above, portions of ACECs and WSRs containing lands with important geological features which overlap with designated wilderness are not included in the analysis.

Table 4-26. Special Designations with Management that would Maintain Geologic Features by Alternative (Acres)

Special Designation	Alternative						
	No Action	I	II	III	IV	V	VI
ACEC	10,000	10,000	0	3,000	10,000	12,000	6,000
WSA[A]	2,000	2,000	0	2,000	0	2,000	2,000
WSR Corridor	9,000	9,000	9,000	9,000	9,000	9,000	9,000

[A] Because the WSA is managed according to BLM Manual 6330, which does not allow for impairment, and since the WSA was recommended unsuitable for wilderness designation, alternatives are compared based on how the WSA would be managed if released from wilderness study by Congress.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, ACEC designations would include 83% of the area identified to have geologic features. The management of ACECs to protect the important values would indirectly maintain these geologic features.

If the Lower Salmon Falls Creek WSA is released from interim management and returned to management under the existing land use plan, its geologic features would continue to be protected by management under the Salmon Falls Creek ACEC.

Eligible and suitable WSR corridors contain 75% of the geologic features area. Protective management of the qualifying Outstandingly Remarkable Values (ORVs) and tentative classification would maintain geologic features, particularly in those segments with geologic and scenic ORVs.

Impacts from Management Common to All Action Alternatives

The areas of geologic features that occur within the WSA boundary would be managed in accordance with BLM Manual 6330, which would maintain these resources.

Impacts from Management Specific to Alternative I

Under Alternative I, ACEC designations would include 83% of the area identified to have geologic features. Impacts would be the same as the No Action Alternative.

If the Salmon Falls Creek WSA is released from interim management and returned to management under the existing land use plan, Alternative I would continue to protect its geologic features through management under the Salmon Falls Creek ACEC.

Management specific to Alternative I for eligible and suitable WSR corridors would be the same as the No Action Alternative.

Impacts from Management Specific to Alternative II

Under Alternative II, no ACECs would be designated. None of the acreage identified to have geologic features would have additional ACEC management that would maintain the geologic features.

If the Lower Salmon Falls Creek WSA is released from interim management, the area would continue to be managed to protect the Outstandingly Remarkable Values (ORVs) associated with the WSR eligible stream segment. Protection of the stream's scenic and geologic values would maintain the geologic features in the canyon. If Congress removes Salmon Falls Creek from consideration under the Wild and Scenic Rivers Act (WSRA), Alternative II would no longer contain restrictions regarding alterations to geologic features in Salmon Falls Canyon.

Management specific to Alternative II for eligible and suitable WSR corridors would be similar to the No Action Alternative.

Impacts from Management Specific to Alternative III

Under Alternative III, ACEC designations would include 25% of the area identified as having important geologic features. Impacts would be similar to the No Action Alternative, but with fewer acres with geologic features contained within an ACEC.

Impacts to geologic features from WSA management in Alternative III would be identical to Alternative I.

Management specific to Alternative III for eligible and suitable WSR corridors would be the same as the No Action Alternative.

Impacts from Management Specific to Alternative IV

Under Alternative IV, ACEC designations would include 83% of the area identified as having geologic features. Impacts would be similar to the No Action Alternative.

If the Lower Salmon Falls Creek WSA is released from interim management, the area would continue to be managed to protect the ORVs associated with the WSR eligible stream segment. Protection of the stream's scenic and geologic values would maintain the geologic features in the canyon. If Congress removes Salmon Falls Creek from consideration under the WSRA, management of the area under Alternative IV would be similar to Alternative II.

Management specific to Alternative IV for eligible and suitable WSR corridors would be the same as the No Action Alternative.

Impacts from Management Specific to Alternative V

Under Alternative V, ACEC designations would include 100% of the area identified as having important geologic features. Impacts would be similar to the No Action Alternative, with more acres with geologic features contained within an ACEC.

If the Salmon Falls Creek WSA is released from interim management and returned to management under the existing land use plan, Alternative V would continue to protect its geologic features through management under the Sagebrush Sea ACEC.

Management specific to Alternative V for eligible and suitable WSR corridors would be the same as the No Action Alternative.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, ACEC designations would include 50% of the area identified as having important geologic features. Impacts would be similar to the No Action Alternative, but with fewer acres with geologic features contained within an ACEC.

Impacts to geologic features from WSA management in Alternative VI would be identical to Alternative I.

Management specific to Alternative VI for eligible and suitable WSR corridors would be the same as the No Action Alternative.

Summary of Direct and Indirect Impacts

Table 4-27 contains the percent of acres with geologic features that would be maintained based on management actions for the identified resources and/or resource uses.

Table 4-27. Areas with Geologic Features that would be Maintained by Alternative (Percent)

Section	Alternative						
	No Action	I	II	III	IV	V	VI
Wilderness Characteristics	0	42	0	0	0	43	0
ACEC	83	83	0	25	83	100	50
WSA	100	100	0	100	0	100	100
WSR	75	75	75	75	75	75	75
Salable Minerals	17	92	8	67	99	92	83
Locatable Minerals	95	92	67	67	98	67	0

Impacts from the No Action Alternative

The No Action Alternative ranks fourth for management that would maintain geologic features. The availability of 83% of lands with geologic features for salable mineral development has the most potential to alter those features. Management that would maintain geologic features includes ACEC management for 83% of the identified resources. While the likelihood of impacts to geologic features is low, the No Action Alternative provides an intermediate level of complementary management (i.e., allocations which would maintain the condition of geologic features), potentially allowing for some disturbance; the effects of these disturbances (e.g., abrasions, small chips) are not expected to be noticeable or extensive. If noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Impacts from Alternative I

Alternative I ranks third for management that would maintain geologic features. Management that would maintain geologic features includes ACEC management for 83%; management of wilderness character on 42% of the identified resources; and the high percentage of lands that are closed to salable mineral development (92%) and recommended for withdrawal from locatable mineral development (92%). If noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Impacts from Alternative II

Alternative II ranks last for management that would maintain geologic features. Geologic features would be indirectly impacted by the absence of complementary management for lands with wilderness character, ACECs, and released WSA lands. Alternative II makes more areas with geologic features available for salable mineral development than any of the alternatives. While the likelihood of impacts to geologic features is low, Alternative II provides the least complementary management, potentially allowing for the most disturbance; the effects of these disturbances (e.g., abrasions, small chips) are not expected to be noticeable or extensive. If noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Impacts from Alternative III

Alternative III ranks sixth for management that would maintain geologic features. Geologic features would be indirectly impacted by availability of lands with geologic features for mineral development. Management that would maintain geologic features would include ACEC management for 25% of the identified resources. While the likelihood of impacts to geologic features is low, Alternative III provides an intermediate level of management, potentially allowing for some disturbance; the effects of these disturbances (e.g., abrasions, small chips) are not expected to be noticeable or extensive. If noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Impacts from Alternative IV

Alternative IV ranks first for management that would maintain geologic features. This alternative would have the second highest proportion of management for ACECs and restrictions on mineral development. While the likelihood of impacts to geologic features is low, Alternative IV potentially allows for some disturbance; the effects of these disturbances (e.g., abrasions, small chips) are not expected to be noticeable or extensive. If noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Impacts from Alternative V

Alternative V ranks second for management that would maintain geologic features. Impacts from management would be similar to Alternative IV. ACEC management would be highest in this alternative and restrictions on salable mineral development would be among the highest. While the likelihood of impacts to geologic features is low, Alternative V potentially allows for some disturbance; the effects of these disturbances (e.g., abrasions, small chips) are not expected to be noticeable or extensive. If

noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Impacts from Alternative VI (Proposed RMP)

Alternative VI ranks fifth for management that would maintain geologic features. Geologic features would be more vulnerable to impacts from locatable mineral development than under the other alternatives. Management that would maintain geologic features would include ACEC management for 50% of the identified resources and restrictions on salable mineral development on 83%. While the likelihood of impacts to geologic features is low, Alternative VI potentially allows for some disturbance; the effects of these disturbances (e.g., abrasions, small chips) are not expected to be noticeable or extensive. If noticeable impacts were to occur (e.g., major removal of rock material, destroying the geologic integrity of the feature), they would be major because the impacts would be permanent.

Cumulative Impacts

There are no past, present, or reasonably foreseeable actions that would affect geologic features in the planning area; therefore, cumulative impacts would be identical to direct and indirect impacts described above.

4.3.3. Soil Resources

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to soil resources:

- **Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion –** 94% of the planning area has medium or higher potential for water erosion and 82% of the planning area has moderate or higher potential for wind erosion (see *Soil Resources* in Chapter 3). Because there is overlap in the classifications, for analysis comparisons, acres for erosion potential categories are listed separately.
- **The amount and type of soil cover** – The amount and type of soil cover influence soil processes that include but are not limited to:
  - Soil erosion: Soil erosion is influenced by the amount of living or dead vegetation cover, biological soil crusts, and rock (Belnap, 2003; Pierson et al., 2007). In general, as cover increases soil erosion potential decreases.
  - Soil nutrient and water cycling: Living and dead vegetation and biological soil crusts contribute soil nutrients through fixation and decomposition. Species diversity of biological soil crusts influences nutrient input. For example, some species that make up biological crusts fix atmospheric nitrogen and make it available for use by other plants. Shrubs such as sagebrush move water deep into the soil profile during rainfall events, and later actively transport water back to the upper soil profile during dry periods (Ryel et al., 2002; Ryel et al., 2003). Water transported back to the upper soil profile is then available for herbaceous plants and microbial processes that increase availability of soil nutrients (Ryel et al., 2002). Cover and species diversity of biological soil crusts influence how water moves into the soil profile and is retained within the profile (Belnap, 2003).
- **Soil bulk density** – Changes in soil bulk density result from activities that apply pressure to the soil surface. Soils have pores and interspaces that allow water to enter the soil profile. Decreases in number and size of pores and interspaces increases soil bulk density, which can result in lower water infiltration rates and increased surface runoff (Tate et al., 2004). Changes in soil bulk density are influenced by a number of factors including soil moisture, soil texture, and surface organic matter (Abdel-Magid et al., 1987; Laycock and Conrad, 1967; Tate et al., 2004; Van Haveren, 1983), and the frequency or intensity of the disturbance (Adams et al., 1981; Eckert et al., 1979; Tate et al., 2004). Recovery can take months to years, depending on environmental and soil factors (Prosser et al., 2000; Stephenson and Veigel, 1987). Laycock and Conrad (1967) caution against concluding that

increases in bulk density alone result in lower infiltration (Laycock and Conrad, 1967). Due to the variability in occurrence and effects of increased soil bulk density, only activities (vehicle traffic, livestock grazing) that consistently and repeatedly apply pressures that compact soils will be considered for this indicator.

Methods and Assumptions

Impacts to soil resources from management in the following sections of Chapter 2 were analyzed in detail: *Soil Resources*, *Upland Vegetation*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Transportation and Travel*, *Land Use Authorizations*, and *Minerals*. Impacts from management in the *Special Status Species*, *Noxious Weeds and Invasive Plants*, *Wild Horses*, and *Areas of Critical Environmental Concern* sections were captured in the analysis of the above sections that were analyzed in detail and, to avoid repetition, were not discussed separately. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for soil resources. Impacts from management actions for soil resources on other resources and resource uses can be found under *Impacts from Soil Resources Actions* in the *Soil Resources, Land Use Authorizations*, *Leasable Minerals*, *Salable Minerals*, *Locatable Minerals,* and *Wilderness* sections.

Quantitative data were not available for amount and type of soil cover and bulk density on the scale of the planning area. Vegetation holds soil together and prevents wind and water from moving them around. The potential for erosion is a measure of how likely soils are to move by the force of wind or water if the soil does not have any vegetation covering it. Geographic information system data layers for soil erosion potential were used to evaluate potential impacts of management actions in areas with medium or greater potential for water erosion and moderate or greater potential for wind erosion. Where geographic locations for management actions were not specified, effects were estimated based on the proportion of the affected area relative to the proportion of potentially erodible soils within the planning area.

The planning area overlaps four different soil surveys. Minor inaccuracies may be present in the geographic information system data, including precise boundaries of soil mapping units and associated data such as erosion potential classes. These errors are considered negligible at the planning area scale.

Major underlying assumptions used in the analyses are:

- Soils rated as medium or greater potential for water erosion and moderate or greater potential for wind erosion are more likely to erode than soils rated as having low potential for water erosion and slight potential for wind erosion.
- Management actions that designate areas as available for land use or open to mineral exploration and development have greater potential to impact soil resources than management actions that designate areas as unavailable or closed, due to potential for increased infrastructure and access routes. However, actual impacts to soils may not be proportional to the size of the areas identified for potential designation or development.

Direct and Indirect Impacts

Impacts from Soil Resources Actions

The following indicators were used to analyze impacts of Soil Resource actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Impacts from Management Specific to the No Action Alternative

Managing native perennial rangelands to attain good ecological condition would influence the amount and composition of vegetation (Dyksterhuis, 1949; Joyce, 1993) and, therefore, would be expected to maintain or improve vegetation cover. This would indirectly maintain or reduce the potential for soil

surface erosion and maintain or improve nutrient and water cycling over 780,000 acres (57%) of the planning area by reducing soil bulk density. Management actions in the No Action Alternative would generally maintain or improve the current condition of soils within the planning area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Maintenance of perennial vegetation cover would protect the soil surface from water and wind erosion, and tend to maintain or improve soil nutrient and water cycling by reducing soil bulk density. Actions common to all alternatives would generally maintain the current condition of soils within the planning area.

Impacts from Management Common to All Action Alternatives

Actions common to all action alternatives would provide direction to reduce impact to soils due to construction of management facilities, land treatments, road maintenance, transportation and travel, and management activities or authorized uses resulting in bare ground and increased soil bulk density. These actions would generally maintain or improve the current condition of soils within the planning area over the long term through project design, avoidance, or mitigation.

Impacts from Management Specific to Alternatives I, II, and III

Actions under Alternatives I, II, and III would maintain or improve the current condition of soils within the planning area and would reduce long-term potential for erosion on 646,000 acres (47%) of the planning area.

Development and implementation of erosion control strategies for new land use authorizations and mineral exploration and development involving surface disturbance would reduce the potential for short- and long-term soil loss on 703,000 acres (51% of the planning area).

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Management actions under Alternatives IV, V, and VI would require mitigation for impacts to soils with an erosion hazard rating of medium or greater for water erosion and moderate or greater for wind erosion. This would potentially reduce the long-term potential for erosion on 1,325,000 acres (96%) of the planning area.

Under Alternatives IV, V, and VI, soil erosion strategies would also be developed and implemented for new land use authorizations, Special Recreation Permits, and mineral exploration and development involving surface disturbance. These strategies would reduce the potential for short- and long-term soil loss over 1,336,000 acres (97%) of the planning area. Prohibition of surface disturbance from new land use authorizations and mineral exploration and development on slopes greater than 40% would eliminate potential adverse impacts on 22,000 acres (2%) of the planning area. Alternatives IV, V, and VI would therefore reduce soil erosion potential on more acres compared to the No Action Alternative or Alternatives I, II, and III.

Impacts from Upland Vegetation Actions

The following indicators were used to analyze impacts of Upland Vegetation actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Vegetation communities influence soil stability, water infiltration, and nutrient cycling. Vegetation provides cover for soils, protecting them from the erosive forces of wind and water. Vegetation can also act as traps and catch wind-blown soils creating areas of soil deposition. Plant community species diversity and structural complexity influences the physical structure and ecological function of soil. Soils under shrubs tend to have lower bulk densities, higher nutrient levels, higher infiltration rates, increased water-holding capacity, larger populations of soil microorganisms, and higher rates of nutrient cycling (Chambers et al., 2007). In plant communities where shrub mounds are interspersed with interspaces occupied by herbaceous plants and biological crusts, water and nutrients tend to run off or migrate from interspaces to

soils under the shrub canopy, thus creating pockets of resource deposition (Eldridge and Rosentreter, 2004).

Alteration of plant communities, particularly conversion of native shrublands and grasslands to annual communities, change water infiltration, nutrient cycling, soil biotic communities, and soil stability (Belnap, 2003; Belnap and Phillips, 2001; Belnap et al., 2005; Booth et al., 2003; Eldridge and Rosentreter, 2004; Hawkes et al., 2006; Sperry et al., 2006). The majority of the biomass in grasslands is produced by roots and soil microorganisms (Stanton, 1988). Invasion of cheatgrass into native plant communities increases root and litter biomass and homogenizes their distribution, which influences the composition of soil biotic communities and nutrient cycling (Belnap and Phillips, 2001; Belnap et al., 2005). Changes in carbon and nitrogen cycles, as well as water infiltration following invasion by non-native annual grasses, are varied and influenced by soil texture, native plant community and cover, and invading species (Belnap, 2003; Ehrenfeld, 2003; Rawls et al., 1989). Vegetation treatments such as prescribed burning; herbicide treatments; targeted grazing; or mechanical treatments including disking, harrowing, drill seeding, chaining, and brush beating may disrupt the soil surface and change or maintain vegetation communities. These treatments can influence soil erosion, soil physical properties, and soil biological communities. Table 4-28 displays anticipated changes in acres of each vegetation sub-group (VSG) by alternative.

Table 4-28. Changes in Vegetation Sub-Group Acres by Alternative (Acres)

VSG	Alternative						
	No Action	I	II	III	IV	V	VI
Annual	-5,000	-47,000	-80,000	-71,000	-80,000	-41,000	-57,000
Non-Native Perennial	+46,000	-48,000	+99,000	+69,000	-195,000	-199,000	-157,000
Non-Native Understory	-20,000	-25,000	-19,000	-1,000	+72,000	+199,000	+41,000
Native Grassland	No change	-233,000	No change	-217,000	-307,000	-198,000	-250,000
Native Shrubland	-21,000	+353,000	No change	+201,000	+510,000	+239,000	+423,000
Unvegetated	No change	No change	No change	+19,000	No change	No change	No change

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would increase the acreage of non-native perennial communities through conversion of annual communities and removal of shrubs in non-native understory communities. Treatments to convert annual communities to perennial resulting in complete removal of existing vegetation would occur on less than 1% of the planning area. This would be accomplished following wildland or prescribed fire and in conjunction with chemical treatment or seeding perennial vegetation. Treatments would remove shrub overstory from non-native understory and native shrubland communities on about 3% of the planning area using prescribed fire or mechanical treatments.

Wildland fire or prescribed burning would be expected to result in a short-term increase in soil surface erosion from water or wind due to removal of vegetation, litter, and remnant biological soil crusts. However, biological crusts are unlikely to be well-developed in annual communities due to high vegetation density and litter deposition (Hilty et al., 2004; Ponzetti et al., 2007). Prescribed fire would result in an increase in cheatgrass (Bradford and Laurenroth, 2006), which can subsequently alter soil nutrients (Ehrenfeld, 2003; Evans et al., 2001; Sperry et al., 2006), and water processes (Belnap et al., 2005; Melgoza et al., 1990). This effect would likely be short-term, as the goals of subsequent seedings and treatments would be to establish perennial vegetation. Dominance of plant communities by perennial versus annual vegetation would provide more consistent cover of the soil surface and thus would reduce potential for soil loss by erosion. Conversion of annual to perennial communities would also improve soil nutrient and water cycling compared to sites dominated by cheatgrass, (Ehrenfeld, 2003; Evans et al., 2001; Sperry et al., 2006) and reduce soil bulk density.

Herbicides used alone or in conjunction with prescribed fire to reduce cheatgrass cover and biomass would result in vegetation removal and a potential increase in soil surface erosion from water or wind. This effect would be short-term if perennial vegetation is established subsequent to treatment. Herbicide treatment would leave vegetative litter on the ground to protect soils and is expected to have less impact to biological soils crusts than fire. Soil nutrient and water cycling would be expected to improve following replacement of annual communities with perennial communities.

Mechanical treatments, including but not limited to drill seeding, broadcast seeding with harrow or chaining, and Dixie harrow, would result in soil surface disturbance, which would result in a short-term increase in erosion potential. Interseeding methods would result in localized disturbance of the soil surface, including biological soil crusts, but would not likely increase potential for soil erosion in the short term since vegetation would be left on site. Soil disturbances from brush beating and mowing would occur from removal of shrubby or herbaceous vegetation canopy and potentially result in increased erosion (Johnson et al., 1980). However, deposition of dead vegetation would create a litter layer, which would provide some protection to the soil surface. Drill seeding, Dixie harrowing, and chaining result in disruption of the soil surface, although furrows created by drill seeding can reduce runoff and increase infiltration (Brown et al., 1985). Soil impacts from rangeland drills can be reduced by the use of depth bands. In general, these types of disturbance disturb but do not eliminate remnant biological soil crusts and establishment of perennial vegetation can promote their recovery (Hilty et al., 2004). The potential for soil erosion following mechanical treatments would decrease in the long term due to increased cover of perennial vegetation.

Removal of shrub canopy can change spatial and temporal patterns in soil surface temperature, with greater temperature variation occurring in areas lacking shrub canopy (Hedrick et al., 1966; Pierson and Wight, 1991). This would influence establishment and survival of organisms that live near the soil surface (Pierson and Wight, 1991). Removal of shrubs would alter soil water patterns by reducing canopy cover that absorbs raindrop impact and the abundance of soil pores that result from surface roots and soil invertebrates that facilitate water flow (Eldridge and Rosentreter, 2004). Over the long term, removal of shrubs can potentially increase soil erosion and soil bulk density and reduce below-surface structural and functional complexity. However, retention of perennial grassland communities, particularly those dominated by mid- to late-successional bunchgrasses, would provide cover for protection of surface soils (Eckert et al., 1986) and have root systems that can facilitate maintenance of soil biotic communities as well as soil nutrient and water cycling (Chambers et al., 2007).

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives would generally maintain or improve conditions that contribute to soil surface erosion. Implementation of drought management guidelines would maintain or improve vegetation cover during drought conditions. Resting vegetation treatment areas from uses such as livestock and wild horse grazing and recreational use until treatment objectives are met and predicted to be sustainable would enhance vegetation cover and reduce short-term potential for soil surface erosion.

Impacts from Management Specific to Alternative I

Alternative I would increase the acreage of native shrubland through conversion of annual, non-native perennial, non-native understory, and native grassland communities. This would be accomplished through use of multiple tools including chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing.

Treatments to convert annual communities to perennial grassland or shrubland communities would occur on about 3% of the planning area. The effects of chemical and mechanical treatments, including seeding and planting, would be similar to those described for the No Action Alternative. Biological treatments, such as the use of insect or fungal pests to control noxious weeds or invasive plants, would not likely result in large-scale, contiguous or simultaneous removal of plant biomass. Biological treatments would not result in increased surface erosion or soil bulk density.

Targeted grazing would result in localized removal of vegetation to reduce fine fuels as well as populations of noxious weeds and invasive plants. Vegetation removal would increase potential for soil erosion due to water or wind. Depending on soil moisture and texture, concentrated livestock use for targeted grazing would result in increased soil bulk density. Effects would be short-term if vegetation removal is followed by a maintenance treatment such as establishment of perennial vegetation. Repeated grazing treatments would result in long-term impacts.

Native shrubland would be restored on 26% of the planning area. This would be accomplished by aerial or mechanical seeding, or planting shrub seedlings by hand or mechanical means. Aerial seeding would occur following other treatments, including chemical treatment and/or mechanical seeding, and wildland fire. Aerial seeding would not result in soil disturbance. Planting shrubs by hand or mechanical means would entail small-scale soil disturbance due to removal of existing vegetation and augering holes at individual shrub locations. Soil surface disturbance would be short-term and would not likely increase potential for erosion. Over the long term, establishment of shrubs would diversify above- and below-ground structure and would result in lower soil bulk density and improved soil nutrient and water cycling.

Reseeding areas disturbed by project construction, maintenance, or removal with a diverse mix of vegetation would minimize soil erosion and protect soil surfaces from raindrop impact, thus reducing the potential for surface sealing and run-off. Prevention of soil loss coupled with re-establishment of species and structural diversity would tend to maintain or improve soil nutrient and water cycling.

Management to maintain or improve the cover of biological soil crusts in native grassland and shrubland communities would protect the soil surface over greater than half of the planning area from erosive processes and enhance nutrient cycling (Belnap et al., 2001a; Belnap et al., 2001b; Evans and Lange, 2001; Warren, 2001a, 2001b).

Impacts from Management Specific to Alternative II

Alternative II would increase the acreage of non-native perennial communities through conversion of annual communities and removal of shrubs in non-native understory communities. This would be accomplished through use of multiple tools including prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing. Treatments to convert annual communities to perennial would occur on about 6% of the planning area. The effects of burning, chemical, and mechanical (including seeding and planting) treatments would be similar to those described for the No Action Alternative. The effects of biological and targeted grazing treatments would be similar to those described for Alternative I.

Shrubs would be removed on about 1% of the planning area in the Non-Native Understory VSG. Effects of specific treatments would be similar to those described for the No Action Alternative and Alternative I, except herbicides would be utilized to kill shrubs in non-native understory communities. Dead sagebrush left in place would continue to provide some thermal insulation to the soil surface (Hedrick et al., 1966). Since there would be no soil surface disturbance or removal of shrub roots, soil bulk density would not likely increase over the short term. Long-term impacts of shrub removal would be the same as those described for the No Action Alternative.

Reseeding areas disturbed by project construction, maintenance, or removal with grasses would minimize soil erosion and protect soil surfaces from raindrop impact, thus reducing the potential for surface sealing and run-off.

Impacts from Management Specific to Alternative III

Alternative III would increase the acreage of non-native perennial and native shrubland communities through conversion of annual and native grassland communities. This would be accomplished through use of multiple tools including prescribed fire; chemical, mechanical, and biological treatments; seeding and planting; and targeted grazing. Treatments to convert annual communities to perennial communities would occur on about 5% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be removed on less than 1% of the planning area in the Non-Native Understory VSG utilizing prescribed fire, chemical, or mechanical treatments. Effects of treatments would be similar to those described for the No Action Alternative.

Native shrubland would be restored on 15% of the planning area. Treatment effects would be similar to those described in Alternative I.

Vegetation on about 1% of the planning area would be removed to create unvegetated fuel breaks. This would be accomplished through use of prescribed fire, chemical, mechanical, or targeted grazing treatments. Complete lack of vegetation, litter, or biological crust cover would increase potential for formation of physical crusts resulting from raindrop impact on the soil surface. This would reduce infiltration and increase run-off. Lack of cover would also leave unvegetated fuel breaks vulnerable to water and wind erosion. Maintenance of unvegetated fuel breaks would require repeated treatment, which would magnify treatment effects and extend them from short- to long-term. Therefore, repeated treatments to maintain unvegetated fuels breaks would result in long-term soil loss due to water and wind erosion, increased bulk density, and reduced infiltration. These effects, while long-term, would be relatively small and localized on a landscape scale.

Effects of treatments on areas disturbed by project construction, maintenance, or removal to reduce wildland fire size and intensity would be dependent on methods and materials. The effects of potential treatments, including seeding to establish perennial vegetation, are described under Alternative I.

Impacts from Management Specific to Alternative IV

Alternative IV would increase the acreage of non-native understory and native shrubland communities through conversion of annual, non-native perennial, non-native understory, and native grassland communities. This would be accomplished through use of prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing. Treatments to convert annual to perennial communities would occur on about 6% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be restored on 42% of the planning area. Treatment effects would be similar to those described in Alternative I, but would cover the greatest area of all alternatives. Treatments to restore non-native understory to native shrubland communities would occur on about 1% of the planning area and would include chemical or targeted grazing treatments to remove or reduce non-native perennial grasses followed by interseeding native understory grasses and forbs. These treatments would result in short-term reductions in understory cover, including biological crusts, with increased potential for soil surface erosion. Targeted grazing would result in increased soil bulk density; however, these effects would be short-term. Over the long term, establishment of diverse native shrubland communities would diversify above- and below-ground structure and would result in lower bulk densities and improve nutrient and water cycling.

Reseeding areas disturbed by project construction, maintenance, or removal with a diverse mix of native vegetation would minimize soil surface erosion. Reduction of soil surface erosion coupled with re-establishment of species and structural diversity would tend to maintain or improve soil nutrient and water cycling.

Management to maintain or improve cover of biological soil crusts would reduce soil surface erosion throughout the planning and improve nutrient and water cycling (Belnap, 2001; Belnap et al., 2001b; Evans and Lange, 2001; Warren, 2001a, 2001b).

Impacts from Management Specific to Alternative V

Alternative V would increase the acreage of non-native understory and native shrubland communities through conversion of annual, non-native perennial, and native grassland communities. This would be accomplished through use of prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland communities, and removal of grazing.

Treatments to convert annual communities to perennial would occur on about 3% of the planning area. The effects of burning, mechanical (including seeding and planting), and biological treatments would be similar to those described for the No Action Alternative and Alternative I. Since chemical treatments would only be used as a last resort, effects due to chemical treatments would be minor. Effects associated with removal of grazing are discussed under *Impacts from Livestock Grazing Actions*.

Shrubs would be restored on 32% of the planning area. Treatment effects would be similar to those described in Alternative I.

Effects of reseeding areas disturbed by project construction, maintenance, or removal with a diverse mix of native vegetation would be the same as those described for Alternative IV.

Effects of management to maintain or improve cover of biological soil crusts throughout the planning area would be the same as for Alternative IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would increase the acreage of non-native understory and native shrubland communities through conversion of annual, non-native perennial, non-native understory, and native grassland communities. This would be accomplished through use of prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing. Treatments to convert annual to perennial communities would occur on about 4% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be restored on 34% of the planning area. Treatment effects would be similar to those described in Alternative I, but would cover more area than Alternatives I, II, III, and V. Treatments to restore non-native understory to native shrubland communities would occur on about 2% of the planning area and would include chemical or targeted grazing treatments to remove or reduce non-native perennial grasses followed by interseeding native understory grasses and forbs. These treatments would result in short-term reductions in understory cover, including biological crusts, with increased potential for soil surface erosion. Targeted grazing would result in increased soil bulk density; however, these effects would be short-term. Over the long term, establishment of diverse native shrubland communities would diversify above- and below-ground structure and would result in lower bulk densities and improve nutrient and water cycling.

Effects of reseeding areas disturbed by project construction, maintenance, or removal with a diverse mix of native vegetation would be the same as those described for Alternative IV.

Effects of management to maintain or improve cover of biological soil crusts throughout the planning area would be the same as for Alternative IV.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze impacts of Wildland Fire Ecology and Management actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Wildland fire is a natural part of the ecosystem. Fire reduces or removes cover of vegetation, biological soil crusts, and litter, which can expose soil to erosion (Hester et al., 1997; Hilty et al., 2004; Johansen, 2001; O'Dea and Guertin, 2003; White and Loftin, 2000). Fire effects on soils are highly variable and dependent on both soil and vegetation characteristics. Vegetation recovery following wildland fire depends on the fire severity, time of year, type of vegetation, and soil moisture (Wright et al., 1979).

Recovery of grasses may take one or more years (Wright et al., 1979), while shrub communities and biological soil crusts may take a decade or more (Hilty et al., 2004; Johansen, 2001). Erosion from wind or water following wildland fire is expected to be higher in areas categorized with moderate or greater erosion potential.

Soil heating can destroy organic matter in surface horizons, resulting in a collapse of soil structure which increases water erosion potential (DeBano et al., 2005). Raindrops can detach particles of exposed soil increasing sediment in the runoff (Emmerich and Cox, 1992). Depending on several factors, including fire severity, type and amount of vegetation cover and soil organic matter, soil texture, and soil water content, wildland fire can produce a water-repellant layer and increase short-term potential for water erosion (Brown et al., 1985; DeBano et al., 2005; Emmerich and Cox, 1992; Rau et al., 2005). Fire can also alter soil nutrient cycling. Effects can be highly variable and are dependent on fire, soil, and vegetation characteristics.

Wildland fires in critical suppression areas are expected to be smaller than wildland fires in conditional suppression areas. Smaller fires are expected to result in fewer acres prone to soil erosion from wind or water. Fire line construction causes localized soil erosion by removing vegetation and displacing soil. Repeated cross-country travel by suppression vehicles on the same path may lead to powdered soils and increase local erosion effects. Fire infrastructure (e.g., fuel breaks, water pipelines or fill areas, helipads, and other facilities) are expected to require access roads for maintenance, but the facilities may help reduce fire size and wildland fire impacts to soils. Table 4-29 displays the erosion potential of lands within critical suppression areas by alternative.

The effects of fuels treatments on soils, including targeted grazing, are described under *Impacts from Upland Vegetation Actions*.

Table 4-29. Erosion Potential in Critical Suppression Areas by Alternative (Acres)

Erosion Potential	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Water Erosion Potential							
Medium	309,000	122,000	295,000	372,000	339,000	582,000	412,000
High	134,000	33,000	140,000	172,000	165,000	396,000	145,000
Wind Erosion Potential							
Moderate	267,000	88,000	264,000	354,000	322,000	711,000	331,000
Severe	62,000	43,000	62,000	62,000	62,000	90,000	108,000
Very Severe	4,000	4,000	4,000	4,000	4,000	4,000	13,000

[A] The No Action Alternative identifies the entire planning area as full suppression; because of the lack of prioritization within the planning area, impacts are most similar to those in conditional suppression areas.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the entire planning area would be under full suppression, with no prioritization for response in the event of multiple ignitions. Due to this lack of prioritization, the No Action Alternative increases risk of burning and short-term loss of vegetation cover in all vegetation types (see *Impacts from Wildland Fire Ecology and Management Actions* in the *Upland Vegetation* section). Vegetation removal by wildland fire would increase risk of soil surface erosion, particularly in areas with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion.

The No Action Alternative directs wildland fire suppression to be conducted with the least surface disturbance possible, with new fire line construction as a last resort. The recommended practice of burning out from natural barriers or existing roads to suppress a wildland fire would potentially expose more soil to erosion than the construction of new fire line, as it usually results in almost complete removal of existing vegetation. Removal of vegetation for fire line construction would also increase potential for soil erosion. Limiting use of surface-disturbing equipment would reduce the depth of soil surface disturbance compared to hand construction of fire lines. This would reduce localized soil erosion due to fire line construction.

Suppression activities require multiple actions to initiate and sustain operations, including but not limited to use of established routes and potential cross-country travel for access and establishment and use of base camps or staging areas. Access routes can be impacted by repeated use by suppression vehicles resulting in increased erosion and soil bulk density.

Establishment and use of base camps or staging areas for large wildland fires would reduce or remove cover of vegetation due to vehicle use and trampling by fire suppression personnel. The concentrated activity would result in short-term and small-scale increases in soil erosion and bulk density. These effects would remain until re-establishment of vegetation cover by rehabilitation or natural recovery, usually less than five years.

Under the No Action Alternative, new fuel breaks would be established and existing fuel breaks would likely be maintained. New fuel breaks would primarily be established through mechanical seeding as part of emergency stabilization and burned area rehabilitation (ES&BAR) treatments. Methods for maintaining fuel breaks would include but are not limited to prescribed fire, mowing, brush beating, or Dixie harrowing. Effects of these treatments are described for the No Action Alternative under the *Upland Vegetation Actions* above. Vegetated fuel breaks may not require maintenance every year.

Restriction of grazing following wildland fire with or without seeding would increase the potential for vegetation recovery and/or establishment over the short term, and would reduce the amount of time that the burned area would have increased risk of soil erosion.

Impacts from Management Common to All Action Alternatives

Wildland fire management actions common to all action alternatives emphasize incorporation of best management practices for wildland and prescribed fire in BLM management activities. Direction to minimize the width of control lines, prioritize use of existing roads prior to construction of new dozer lines, and use of natural firebreaks and existing roads and trails to contain wildland fire in special designation areas would reduce potential for wind or water erosion in small-scale, linear areas.

Fuels and ES&BAR management actions common to all action alternatives provide direction to minimize treatment-related soil surface disturbance, which would reduce soil erosion potential. Direction for rest of treated and burned areas from uses including livestock, wild horses, and recreation would increase the potential for vegetation recovery and seeding establishment and reduce the amount of time that the burned area has increased risk for soil erosion.

Impacts from Management Specific to Alternative I

Fire suppression priorities in Alternative I would protect soils with high potential for water erosion through protection of native plant communities in Vegetation Management Areas (VMAs) B and C. Alternative I would reduce risk of erosion due to vegetation cover removal on soils rated as severe to very severe potential for wind erosion through protection of wildland urban interface (WUI) areas along the Snake River and the Middle Snake Area of Critical Environmental Concern (ACEC). Effects of wildland fire suppression activities would be similar to those described for the No Action Alternative.

Construction, use, and maintenance of new roads to facilitate wildland fire suppression would result in long-term increases in soil bulk density. The combination of road surface, ditches, and culverts would be expected to concentrate water flows and increase erosion. This impact would be expected to increase with slope and precipitation. Soils in areas with relatively flat slopes would be less likely to have water erosion compared to steeper slopes. Existing routes improved for wildland fire suppression already have some increased soil erosion and bulk density. Improvements to roads, including but not limited to widening and installation of ditches and culverts, would result in impacts similar to those described for new roads.

Establishment of new water developments for wildland fire suppression would result in some additional route construction for access and maintenance. Soil bulk density would be expected to increase under frequently used routes. Soil bulk density would also increase in areas around ponds or hydrants repeatedly accessed by wildland fire suppression equipment such as water tenders and heavy engines. Actions to improve water access for wildland fire suppression including modification of existing water

pipelines for hydrant installation, enlarging ponds or reservoirs, and adding storage tanks would involve soil disturbance using heavy equipment. These actions would be small in scale but would result in some localized increases in erosion and soil bulk density.

Construction of new guard stations would result in small-scale disturbance due to excavation and construction activities. Establishment, use, and maintenance of access roads and parking areas would result in increased soil bulk density and potential increases in soil erosion. This disturbance would be negligible on a landscape scale.

Improved wildland fire suppression abilities would be expected to reduce wildland fire size. Increases in soil erosion and bulk density resulting from these actions would be less compared to the impacts associated with large wildland fires. Restrictions on transportation and travel during vulnerable periods including hot, dry weather would reduce the potential for human-caused fire and the resultant impacts to soils.

Approximately 11,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative I. Impacts of establishment and maintenance of fuel breaks are described for the No Action Alternative and are expected to be minor on the scale of the planning area.

Impacts from Management Specific to Alternative II

Fire suppression priorities in Alternative II would protect little of the area containing soils with high potential for water erosion. Alternative II would reduce erosion risk due to vegetation removal by wildland fire on soils rated as severe to very severe potential for wind erosion through protection of the WUI and perennial grassland areas along the Snake River.

The impacts of wildland fire suppression activities would be similar to those described for the No Action Alternative. The impacts of increased wildland fire suppression infrastructure in Alternative II would be similar to those described for Alternative I. Lack of restrictions on transportation and travel during vulnerable periods including hot, dry weather would increase potential for human-caused fire and the resultant impacts to soils.

Approximately 13,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative II. Impacts of establishment and maintenance of fuel breaks are described for the No Action Alternative. Impacts of fuel breaks are expected to be minor on the scale of the planning area.

Impacts from Management Specific to Alternative III

Fire suppression priorities in Alternative III would protect similar amounts of area containing soils with medium or higher potential for water erosion as Alternative I. Alternative III would reduce impacts from wildland fire to soils rated as severe to very severe potential for wind erosion through protection of the WUI and perennial grassland areas along the Snake River.

The impacts of wildland fire suppression activities and increased wildland fire suppression infrastructure in Alternative III would be similar to those described for the No Action Alternative and Alternative I. Impacts of building new helipads and airstrips would be similar to impacts of guard station construction. Impacts of airstrip maintenance would be similar to effects of maintaining vegetated fuel breaks, but on a smaller scale. Restrictions on transportation and travel during vulnerable periods including hot, dry weather would decrease potential for human-caused fire and the resultant impacts to soils.

Approximately 25,000 acres (2% of the planning area) of vegetated fuel breaks and 19,000 acres (1% of the planning area) of unvegetated fuel breaks would be installed under Alternative III. Impacts of establishment and maintenance of unvegetated fuel breaks include increased potential for erosion due to removal of vegetation cover and increased soil bulk density if equipment is used to maintain the unvegetated fuel breaks. Impacts of establishment and maintenance of vegetated fuel breaks are described for the No Action Alternative. Impacts of fuel breaks are expected to be minor on the scale of the planning area.

Impacts from Management Specific to Alternative IV

Under Alternative IV-A, critical suppression areas would contain more acres of soils with medium or greater potential for water erosion or moderate potential for wind erosion compared to Alternatives I, II, III, or IV-B. Acres in critical suppression areas with severe or very severe potential for wind erosion would be the same as in Alternatives I, III, and IV-B.

Under Alternative IV-B, critical suppression areas would contain more acres of soils with medium or greater potential for water erosion or moderate potential for wind erosion compared to the No Action Alternative or Alternatives I, II, or III and slightly fewer acres compared to Alternative IV-A. Acres in critical suppression areas with severe or very severe potential for wind erosion would be the same as Alternatives I, III, and IV-A.

Fire suppression priorities in Alternative IV would protect more acres of soils with high potential for water erosion than Alternatives I, II, and III through protection of key greater sage-grouse (sage-grouse) habitat, native plant communities, and the Inside Desert and Jarbidge Foothills ACECs. Alternative IV would have similar protections to Alternatives I and III for soils rated as severe to very severe potential for wind erosion through protection of WUI areas along the Snake River.

The impacts of wildland fire suppression activities and increased wildland fire suppression infrastructure in Alternative IV would be similar to those described for the No Action Alternative and Alternative I. Localized impacts due to building or improving water developments would be less under Alternative IV than Alternative I. Restrictions on transportation and travel during vulnerable periods such as hot, dry weather would decrease potential for human-caused fire and the resultant impacts to soils.

Approximately 11,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative IV. Impacts of establishment and maintenance of fuel breaks are described for the No Action Alternative. Impacts of fuel breaks are expected to be minor on the scale of the planning area.

Impacts from Management Specific to Alternative V

Under Alternative V, critical suppression areas would contain more acres of soils with medium or greater potential for water erosion or moderate to severe potential for wind erosion compared to the other action alternatives. Acres in critical suppression areas with very severe potential for wind erosion would be similar to the other action alternatives.

Fire suppression priorities in Alternative V would protect almost all of the area containing soils with high potential for water erosion through protection of key sage-grouse habitat, native plant communities, and the Sagebrush Sea ACEC. Alternative V would protect a greater area compared to the other action alternatives for soils rated as severe for potential wind erosion through protection of WUI areas along the Snake River as well as the Sagebrush Sea ACEC.

The impacts of wildland fire suppression activities and improvements to existing infrastructure would be similar to those described for the No Action Alternative and Alternative I. Localized impacts due to construction of new infrastructure would not occur under Alternative V. Restrictions on transportation and travel during vulnerable periods such as hot, dry weather would decrease potential for human-caused fire and the resultant impacts to soils.

Approximately 7,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative V. Impacts of establishment and maintenance of fuel breaks are described for the No Action Alternative. Impacts of fuel breaks are expected to be minor on the scale of the planning area.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Fire suppression priorities in Alternative VI would protect soils with high potential for water erosion through protection of native plant communities in VMAs B and C. Alternative VI would reduce risk of erosion due to vegetation cover removal on soils rated as severe to very severe potential for wind erosion through protection of 597,000 acres including the WUI, sage-grouse management area, and slickspot

peppergrass habitat. Effects of wildland fire suppression activities would be similar to those described for the No Action Alternative.

Effects of construction, use, and maintenance of new roads along with improvement of existing routes for wildland fire suppression would be the same as Alternative I.

Establishing new water developments for wildland fire suppression would result in effects similar to those under Alternative I. Actions to improve water access for wildland fire suppression including modification of existing water pipelines for hydrant installation, enlarging ponds or reservoirs, and adding storage tanks would involve soil disturbance using heavy equipment. These actions would be small in scale but would result in some localized increases in erosion and soil bulk density.

Construction of new guard stations would result in small-scale disturbance due to excavation and construction activities. Establishment, use, and maintenance of access roads and parking areas would result in increased soil bulk density and potential increases in soil erosion. This disturbance would be negligible on a landscape scale.

Improved wildland fire suppression abilities would be expected to reduce wildland fire size. Increases in soil erosion and bulk density resulting from these actions would be less compared to the impacts associated with large wildland fires. Restrictions on transportation and travel during vulnerable periods including hot, dry weather would reduce the potential for human-caused fire and the resultant impacts to soils.

Approximately 11,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative VI. Impacts of establishment and maintenance of fuel breaks are expected to be minor on the scale of the planning area. Methods for maintaining fuel breaks would include but are not limited to prescribed fire, mowing, brush beating, or Dixie harrowing. Effects of these treatments are described for the No Action Alternative under the *Upland Vegetation Actions* above.

Impacts from Livestock Grazing Actions

The following indicators were used to analyze impacts of Livestock Grazing actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Livestock grazing influences soil properties primarily through removal of vegetation and trampling. The effects of livestock use on soils are influenced by a variety of factors including season of use, soil moisture, soil texture, stocking rate, and location and density of concentration areas such as water or supplement sources or trailing areas (Hart et al., 1993; Rawls et al., 1989; Tate et al., 2004; Van Haveren, 1983). Livestock use reduces plant cover, particularly cover of herbaceous plants, potentially increasing risk of soil erosion. Limited research has been conducted evaluating soil erosion relative to specific utilization (Giordanego et al., 2003). Light to moderate stocking levels (less than 40%) for native grassland and shrubland are believed to provide adequate protection of soil from water and wind erosion (Giordanego et al., 2003; Holechek et al., 1998).

The effects of livestock use on biological soil crusts depend on soil texture, crust composition, patterns of seasonal moisture, season of use, and trampling intensity (Warren and Eldridge, 2001). In general, livestock trampling reduces biological soil crust cover (Anderson et al., 1982; Beymer and Klopatek, 1992; Brotherson et al., 1983; Warren and Eldridge, 2001), potentially increasing risk of soil erosion. Biological soil crusts are more susceptible to cover reductions due to livestock trampling during dry periods, compared to times when the crust is moist or frozen (Marble and Harper, 1989; Memmot et al., 1998). Memmot and others (1998) found that winter grazing in south-central Idaho when soils are frozen or snow covered maintained biological soil crust cover, while spring and summer use decreased cover. Disturbance of biological soil crusts can change water infiltration patterns within plant communities and

may alter nutrient and water cycling on a landscape scale (Belnap et al., 2005). No known research evaluates specific utilization levels to maintain or increase biological soil crust cover or soil erosion. This relationship has primarily been evaluated by measuring biological soil crust cover at increasing distances from water sources. In general, crust cover is greater with increasing distance from water (Warren and Eldridge, 2001).

Changes in soil bulk density due to livestock grazing are influenced by several factors including soil texture, moisture, and organic matter content, as well as grazing intensity (Abdel-Magid et al., 1987; Laycock and Conrad, 1967; Van Haveren, 1983) and time of year (Stephenson and Veigel, 1987). Livestock grazing when soils are moist may result in increased bulk density compared to grazing on the same soils when they are drier (Van Haveren, 1983). Patterns and intensity of use can change soil bulk density. Stocking at high rates would increase soil bulk density and reduce infiltration over low or moderate stocking rates (Abdel-Magid et al., 1987). Soil bulk density is most affected at livestock concentration areas (Tate et al., 2004), including watering and supplement locations.

The effects described above would not occur in areas unavailable for livestock grazing; these areas are displayed by erosion potential in Table 4-30.

Table 4-30. Erosion Potential in Acres Unavailable for Livestock Grazing by Alternative (Acres)

Erosion Potential	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Water Erosion Potential								
Medium	17,000	37,000	20,000	22,000	73,000	52,000	192,000	23,000
High	5,000	12,000	7,000	7,000	39,000	28,000	70,000	7,000
Wind Erosion Potential								
Moderate	12,000	30,000	17,000	18,000	96,000	65,000	167,000	17,000
Severe	9,000	15,000	9,000	10,000	11,000	11,000	44,000	10,000
Very Severe	400	1,000	400	500	700	700	9,000	500

The amount of vegetation removal and change in plant cover is related to the proportion of vegetation production allocated for livestock grazing and the acres available for livestock grazing. In this analysis, estimated animal unit months (AUMs), which incorporate both of these allocations, are used to compare the proportion of vegetation allocated for livestock in each alternative.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 1,412,000 acres would be available and 51,000 acres would be unavailable to livestock grazing. Soils in areas unavailable for livestock use would tend to sustain vegetation cover for soil surface protection and would not have potential for increased erosion or soil bulk density associated with concentrated use areas or infrastructure.

Allocated AUMs would be dependent on production and would start at 200,000, but could range from 160,000 to a maximum of 260,000 at full implementation, assuming vegetation objectives are achieved. Livestock use would be expected to maintain or slightly increase current levels of soil erosion and bulk density. Authorization of temporary non-renewable (TNR) permits or increases in AUMs due to increased forage production would result in increased soil bulk density and decreased biological crust cover, which would increase risk of soil erosion. Management actions that incorporate wildlife forage and cover needs, or improve ecological condition to good or better, would tend to maintain or improve vegetation and biological crust cover and reduce potential for soil erosion. Grazing systems with consistent livestock use when soils are moist would result in greater potential for increased soil bulk density than systems where regular use by livestock occurs during dry periods. Livestock concentration areas, including water and supplement locations, holding areas, stock driveways, and fence lines would be expected to have higher soil erosion and bulk density compared to surrounding areas.

Construction, installation, and maintenance of watering facilities including reservoirs, wells, troughs, and spring developments can result in both linear disturbance corridors due to access needs and a zone of disturbance that radiates out from the watering location (Brooks et al., 2006; Lange, 1969; Rogers and Lange, 1971). Size of the impacted area depends on levels and consistency of use, but complete removal of vegetation and biological soil crusts can occur within a 50- to 100-foot radius of a watering site. These sites have high potential for long-term increased soil bulk density and erosion potential due to trampling and vegetation removal. Similar effects can be found at locations where salt or supplements are offered.

Increases in the miles of pipelines and fences would result in increased density of linear disturbance. Installation and maintenance of pipelines results in linear disturbance resulting from burial and, unless pipelines are installed along existing roads, formation and maintenance of primitive roads through repeated use. Areas of new construction would have increased potential for soil erosion due to disruption of the soil profile for burial; roads used for maintenance would have increased soil bulk density and erosion potential due to repeated use. Fence construction does not result in the same degree of soil disturbance as pipeline construction, but primitive roads often form on one or both sides of the fence due to maintenance and other uses. Repeated use along fences due to maintenance and livestock trailing can also create linear disturbances that have increased soil bulk density and may be vulnerable to erosion.

Actions that exclude livestock from reservoirs and springs and prohibit placement of salting, feeding, holding facilities, or stock driveways in riparian areas would reduce the potential for increased soil bulk density due to livestock trampling in wet conditions.

Impacts from Management Common to All Action Alternatives

These actions would help maintain or improve vegetation cover and structure and would tend to reduce potential for increased soil surface erosion and bulk density.

Implementation of drought management guidelines would be expected to retain adequate vegetation cover to protect soils during periodic drought cycles. The Aquatic and Riparian Management Strategy management actions, found in Chapter 2, would minimize disturbances at developed springs and would reduce the potential for increased soil bulk density due to livestock trampling in wet conditions.

Periodic spring or early summer grazing of big game winter range to improve browse would result in an increase in soil bulk density if use occurs during moist periods. Since grazing would not likely occur yearly in the same areas, this effect is expected to be short-term.

Impacts from Management Specific to Alternative I

Under Alternative I, 1,389,000 acres would be available and 74,000 acres would be unavailable to livestock grazing. More acres of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion would be unavailable for livestock use compared to the No Action Alternative. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts to soils with high potential for water erosion and severe to very severe potential for wind erosion in Alternative I would be less than in the No Action Alternative due to increased acreage unavailable for grazing.

Allocated AUMs would be dependent on production and would range from a minimum of 179,000 to a maximum of 245,000 assuming vegetation objectives are achieved after vegetation treatments. Initially, allocated AUMs may be as high as 259,000 and would decrease as vegetation objectives are achieved. Livestock allocations would be similar to those described for the No Action Alternative. However, since use would be allocated over about 2% less acreage in the planning area, impacts would be spread over a slightly smaller area.

Livestock use would be expected to maintain current levels of soil erosion and bulk density. Authorization of TNR permits or increases in AUMs due to increased forage production would result in increased soil bulk density and decreased biological crust cover, which would increase risk of soil erosion. Fences added to protect reference areas would be in addition to fences used to facilitate livestock management. Livestock would likely trail along these fences, locally increasing soil bulk density in trailing areas.

Estimated utilization levels to achieve resource and use objectives of 30% to 40% for native communities and 40% to 50% for non-native communities are generally considered to be of moderate intensity (Holechek, 1988; Holechek et al., 1998).Utilization at the upper end of the ranges would likely maintain current levels of soil erosion and bulk density; utilization at the lower end of the ranges or below would likely reduce impacts (Holechek et al., 1999). Biological soil crusts are more sensitive to livestock disturbance than vascular plants and would likely have higher cover and species diversity in native communities with lower utilization (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic heavy use (up to 70% every five years) in non-native communities would result in short-term increased soil bulk density and potential for wind and water erosion due to loss of vegetation, biological soil crust, and litter cover.

Likewise, targeted grazing treatments would occur in late spring and early summer to reduce fine fuels and other undesirable vegetation. Because livestock use is intensified during targeted grazing, vegetation and biological soil crust cover would be reduced. Depending on soil moisture and texture, targeted grazing would likely result in short-term increases in soil bulk density, with potential for long-term effects with yearly repeated treatments. Soils in areas that receive targeted grazing are potentially more vulnerable to water or wind erosion following treatment due to reduction of vegetation, biological soil crust, and litter cover. Areas treated with targeted grazing would be small and would not have major or long-term impacts at the planning area scale.

The number, type, and density of range infrastructure developments under Alternative I would be similar to the No Action Alternative; however locations would be modified to meet resource objectives. Effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative.

Removal or relocation of fences would result in short-term increases in soil erosion and bulk density due to motorized vehicle access for removal of posts, wire, and other components.

Impacts from Management Specific to Alternative II

Under Alternative II, 1,408,000 acres would be available and 55,000 acres would be unavailable to livestock grazing. Slightly more acres of soils with medium or greater potential for water erosion and moderate or severe potential for wind erosion would be unavailable for livestock use compared to the No Action Alternative, but less than for Alternative I. The number of acres unavailable to livestock grazing with very severe potential for wind erosion would be about the same as in the No Action Alternative and less than for Alternative I. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts would occur on about the same number of acres of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion as the No Action Alternative and on more acres than Alternative I.

Allocated AUMs would be dependent on production and would range from 350,000 to a maximum of 440,000, assuming vegetation objectives are achieved. Increased allocations and anticipated increases in number and density of livestock infrastructure developments to support allocations would likely result in increased soil erosion and bulk density throughout the areas available for grazing. Effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative, but would occur at a higher density within areas available to grazing.

Effects of TNR permits and targeted grazing would be similar to those described for Alternative I. Estimated utilization levels to achieve resource and use objectives of 40% to 50% for native communities and 50% to 60% for non-native communities are generally considered to be of moderate to high intensity (Holechek, 1988; Holechek et al., 1998). Utilization at the upper end of the ranges would tend to reduce vegetation, biological soil crust, and litter cover and increase current levels of soil surface erosion and soil bulk density; utilization at the lower end of the ranges or below would be required to maintain static conditions (Holechek et al., 1999). Biological soil crust cover and species diversity would be reduced under moderate to high utilization (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic short-term heavy use (up to 70% every five years) is expected to have impacts similar to those described for Alternative I.

Impacts from Management Specific to Alternative III

Under Alternative III, 1,407,000 acres would be available and 56,000 acres would be unavailable to livestock grazing. More acres of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion would be unavailable for livestock use in Alternative III compared to the No Action Alternative or Alternative II, but less than in Alternative I. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts would occur on slightly fewer acres of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion compared to the No Action Alternative and Alternative II and on slightly more acres than Alternative I.

Allocated AUMs would be dependent on production and would range from a minimum of 273,000 to a maximum of 348,000, assuming vegetation objectives are achieved. Increased allocations compared to the No Action Alternative and anticipated increases in number and density of livestock infrastructure developments to support allocations would likely result in increased soil erosion and bulk density throughout the areas available for grazing. Effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative. Effects of allocations and infrastructure development would occur at a higher density within areas available to grazing compared to the No Action Alternative and Alternative I, but at a lower density compared to Alternative II. Effects of fence removal or relocation would be similar to those described for Alternative I.

Effects of TNR permits and targeted grazing would be similar to those described for Alternative I. Estimated utilization levels to achieve fire management and resource objectives are 30% to 40% for native communities and 50% to 60% for non-native perennial communities. Effects of utilization levels in native communities would be similar to those described for Alternative I; effects of utilization levels in non-native communities would be similar to Alternative II. Biological soil crusts would have greater cover and species diversity in native communities with lower utilization. Periodic short-term heavy use (up to 70% every five years) is expected to have results similar to those described for Alternative I.

Impacts from Management Specific to Alternative IV

Under Alternative IV-A, 1,324,000 acres would be available and 139,000 acres would be unavailable to livestock grazing. More acres of soils with medium or greater potential for water erosion and moderate potential for wind erosion would be unavailable for livestock use compared to the No Action Alternative or Alternatives I, II, or III. Acres unavailable with severe or very severe potential for wind erosion would be greater than the No Action Alternative or Alternatives II or III, but less than for Alternative I. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts would occur on fewer acres of soils with medium or greater potential for water erosion and moderate potential for wind erosion than for the No Action Alternative or Alternatives I, II, or III. Impacts would occur on about the same acreage of soils with severe or very severe potential for wind erosion as the No Action Alternative and Alternatives II and III, but on more acreage than Alternative I.

Under Alternative IV-B, 1,355,000 acres would be available and 108,000 acres would be unavailable to livestock grazing. More acres of soils with medium or greater potential for water erosion and moderate potential for wind erosion would be unavailable for livestock use compared to the No Action Alternative or Alternatives I, II, or III, but less than for Alternative IV-A. Acres unavailable with severe or very severe potential for wind erosion would be greater than the No Action Alternative or Alternatives II or III, but less than for Alternative I and similar to Alternative IV-A. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts would occur on fewer acres of soils with medium or greater potential for water erosion and moderate potential for wind erosion than for the No Action Alternative or Alternatives I, II, or III, and on slightly more acres than Alternative IV-A. Impacts would occur on about the same acreage of soils with severe or very severe potential for wind erosion as the No Action Alternative and Alternatives II, III, and IV-A, but on more acreage than Alternative I.

Allocated AUMs would be dependent on production. Under Alternative IV-A, AUMs would range from a minimum of 78,000 to a maximum of 123,000, assuming vegetation objectives are achieved. Under Alternative IV-B, allocated AUMs would range from a minimum of 81,000 to a maximum of 151,000, assuming vegetation objectives are achieved.

Decreased allocations compared to the No Action Alternative and anticipated decreases in number and density of livestock infrastructure developments needed to support allocations would result in long-term decreased soil erosion and bulk density throughout the areas available for grazing. This effect would be more pronounced under Alternative IV-A compared to IV-B. Effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative. Effects of allocations and infrastructure development would occur at a lower density within areas available for grazing compared to the No Action Alternative and Alternatives I, II, and III. Effects of fence removal or relocation would be similar to those described for Alternative I.

Effects of TNR permits and targeted grazing would be similar to those described for Alternative I. However, since TNR permits would not be allowed in pastures with greater than 25% native communities (by cover), excluding Sandberg/non-native areas, the proportion of landscape affected would be less than for the No Action Alternative or Alternatives I, II, or III. Periodic heavy use would not occur under Alternative IV. Therefore, impacts due to livestock use would be further reduced compared to Alternatives I, II, and III.

Estimated utilization levels to achieve resource objectives of 20% to 30% for native communities and 30% to 40% for non-native communities are generally considered to be of light intensity (Holechek, 1988; Holechek et al., 1998). Utilization within these ranges, particularly at the lower end of the ranges or below would tend to reduce soil erosion and soil bulk density to maintain or increase of vegetation cover (Holechek et al., 1999). Light utilization levels under Alternative IV would also tend to promote greater cover and species diversity for biological crusts (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001).

Impacts from Management Specific to Alternative V

Under Alternative V, 1,160,000 acres would be available and 303,000 acres would be unavailable to livestock grazing. The greatest acreage of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion would be unavailable for livestock use compared to all other alternatives. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts would occur on the least acreage with soils of medium or greater potential for water erosion and moderate or greater potential for wind erosion than for all other alternatives.

Allocated AUMs would be dependent on production and would range from a minimum of 42,000 to a maximum of 93,000, assuming vegetation objectives are achieved. Decreased allocations and anticipated decreases in number and density of livestock infrastructure developments needed to support allocations would likely result in long-term decreased soil erosion and bulk density throughout the areas available for grazing. This effect would be more pronounced under Alternative V than all other alternatives. Effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative, except there would be no impacts due to pipeline construction. Effects of allocations and infrastructure development would occur at the lowest density within areas available for grazing compared to all other alternatives. Effects of fence removal or relocation would be similar to those described for Alternative I.

There would be no TNR permits, targeted grazing, or periodic heavy use under Alternative V. Therefore, impacts due to livestock use would be further reduced compared to all other alternatives.

The effects of estimated utilization levels would be similar to Alternative IV, except in the Sagebrush Sea Area of Critical Environmental Concern (ACEC) where utilization levels of 10% to 20% would further reduce impacts to soils. These lower utilization levels would be light intensity use and would further promote greater cover and species diversity for biological crusts.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 1,406,000 acres would be available and 57,000 acres would be unavailable to livestock grazing. More acres of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion would be unavailable for livestock use in Alternative VI compared to the No Action Alternative or Alternative II, about equal to Alternative III, and less than in Alternative I, IV, and

V. Effects of non-use would be the same as those described for the No Action Alternative. Livestock-related impacts would occur on slightly fewer acres of soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion compared to the No Action Alternative and Alternative II and on slightly more acres than Alternative I.

Under Alternative VI, allocated AUMs would depend on production and other restrictions in place due to resource needs (e.g. sage-grouse habitat requirements, slickspot peppergrass restrictions). The initial implementation range of AUMs would be 216,000 to a maximum of 326,000. A minimum of 186,000 AUMs would be allocated, increasing to 279,000 assuming vegetation objectives are achieved at full implementation of the land use plan.

Increased allocations compared to the No Action Alternative and anticipated increases in number and density of livestock infrastructure developments to support allocations would likely result in increased soil erosion and bulk density throughout the areas available for grazing. Effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative. Effects of allocations and infrastructure development would occur at a lower density within areas available for grazing compared to the No Action Alternative and Alternatives II and III. Effects of fence removal or relocation would be similar to those described for Alternative I.

Effects of TNR permits and targeted grazing would be similar to those described for Alternative I. However, the proportion of the landscape affected would be less than for the No Action Alternative and Alternatives II and III.

Estimated stocking levels from allocations of up to 40% for native communities and up to 45% for non-native communities are generally considered to be of moderate intensity (Holechek, 1988; Holechek et al., 1998). Utilization within these ranges, particularly at the lower end of the ranges or below would tend to maintain current levels to slightly reduce soil erosion and soil bulk density and help maintain or increase vegetation cover (Holechek et al., 1999). Under the moderate utilization levels proposed under Alternative VI biological soil crust cover and species diversity would be reduced (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001).

Impacts from Transportation and Travel Actions

The following indicators were used to analyze impacts of Transportation and Travel actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Construction, use, and maintenance of roads, primitive roads, and trails increase soil bulk density. This reduces water infiltration, concentrates water flow, and increases runoff, resulting in localized areas of increased soil erosion by water (Adams et al., 1981; Forman and Alexander, 1998; Gelbard and Belnap, 2003; Iverson et al., 1981; Switalski et al., 2004; Trombulak and Frissell, 2000). The effects increase with slope. Roadside depositions created by grading can modify soil nutrient and water cycling by changing soil depth, chemistry, and texture (Gelbard and Belnap, 2003).

Cross-country motorized vehicle use can result in increased soil erosion and bulk density, (Adams et al., 1981; Eckert et al., 1979; Iverson et al., 1981). Tire tracks can concentrate water flow and can contribute to soil erosion (Eckert et al., 1979), with greater effects when soils are wet (Adams et al., 1981). Increased soil bulk density resulting from vehicle use may take several years to decades to recover once use is halted (Prosser et al., 2000; Trombulak and Frissell, 2000).

Cross-country motorized vehicle use can decrease cover of biological soil crusts (Belnap and Eldridge, 2001). The effects of vehicle use depend on several factors including soil texture, soil moisture, soil chemistry, and crust composition. Belnap (2002) determined that as few as four passes with a slow-

moving vehicle crushed biological soil crusts. This can result in increased erosion and changes to nutrient and water cycles.

Impacts from Management Specific to the No Action Alternative

Travel Management Areas (TMAs) would not be delineated under the No Action Alternative. The majority of the planning area would be open to cross-country motorized vehicle use, this type of use would be expected to increase, and additional unplanned routes would be created by repeated use. This would result in a long-term increase in route density within the planning area.

Increased route density would increase the proportion of the planning area where soils have increased soil bulk density. Since the majority of the soils in areas designated as open to cross-country motorized vehicle use are classified as medium or greater potential for water erosion or moderate or greater potential for wind erosion, soil surface erosion due to vehicular use would increase over the planning area.

Areas closed to motorized vehicle use in the No Action Alternative would be limited to the Salmon Falls Creek Area of Critical Environmental Concern (ACEC) and the Bruneau and Jarbidge Rivers wilderness, which are physically restrictive to motorized transportation.

Table 4-31. Erosion Potential by Travel Designation in the No Action Alternative (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	15,000	620,000	217,000
High	25,000	308,000	111,000
Wind Erosion Potential			
Moderate	28,000	696,000	187,000
Severe	200	113,000	85,000
Very Severe	0	12,000	6,000

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction and protective mechanisms that would reduce impacts to soils due to route or use designations. The exception for cross-country motorized vehicle travel to members of the Shoshone-Paiute or Shoshone-Bannock Tribes would contribute to continued use of some undesignated routes by the tribes. The impacts from use of undesignated routes by tribal members are expected to be minimal.

Impacts from Management Specific to Alternative I

Under Alternative I, less than 1% of the planning area would be open to cross-country motorized vehicle use, 91% would be limited to designated routes, and 8% would be closed to motorized vehicle use. Most of the acreage with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion would be within areas where travel is limited to designated routes.

Areas closed to motorized vehicle use in Alternative I would be limited to the Salmon Falls Creek ACEC and the Bruneau-Jarbidge Rivers wilderness, which are physically restrictive to motorized transportation. Areas closed to motorized vehicle use in Alternative I would protect soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion. Alternative I would protect over six times more acres than the No Action Alternative. These areas would be free of the impacts associated with roads and cross-country motorized vehicle use. Closure would allow vegetation and biological soil crust recovery and would result in a long-term decrease in soil erosion and bulk density. Almost half of the acres classified as having very severe potential for wind erosion are closed to motorized vehicle use.

Table 4-32. Erosion Potential by Travel Designation in Alternative I (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	44,000	805,000	3,000
High	43,000	400,000	400
Wind Erosion Potential			
Moderate	63,000	846,000	2,000
Severe	1,000	197,000	1,000
Very Severe	0	19,000	100

Seasonal closures or restrictions on primitive roads, trails, and open areas would reduce potential for human-caused fire and the resultant impacts to soils.

Approximately 3,600 acres of the Deadman/Yahoo Special Recreation Management Area (SRMA), contained within the Deadman/Yahoo TMA, would be designated open to cross-country motorized vehicle use. This small area has a high density of motorized use, which would be expected to continue under the open designation. Most of the acreage designated as open has soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion; however, this acreage is small on the scale of the planning area and the effects would be local and minor on that scale. Open designation would result in the continuation of unvegetated areas due to concentrated disturbance that would likely increase levels of soil erosion and bulk density as compared to surrounding areas not available for cross-country motorized vehicle use.

Approximately 49% of the planning area would retain the current level of route density, primarily in the Devil Creek TMA. Most of the acreage in the Devil Creek TMA has soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. Since the focus of this TMA would be to balance livestock grazing management needs with restoration activities, it is anticipated that routes would continue to provide access to existing livestock facilities and existing routes would be modified or new routes would be created for establishment of new facilities. This would likely maintain current levels of soil erosion and bulk density.

Route density is expected to decrease over approximately 48% of the planning area. This decrease would be focused in the Canyonlands, Jarbidge Foothills, and Snake River TMAs. Route reduction would tend to increase vegetation and biological soil crust cover over the long term, which would result in reduced soil erosion and bulk density. The impacts would be most prominent in the Snake River TMA, as it has the greatest proportion of soils prone to erosion.

Table 4-33. Erosion Potential by Travel Management Area in Alternative I (Acres)

Erosion Potential	Canyonlands	Deadman/ Yahoo	Devil Creek	Jarbidge Foothills	Snake River
Change in Route Density	Decrease	Increase	No Change	Decrease	Decrease
Water Erosion Potential					
Medium	112,000	32,000	326,000	125,000	258,000
High	72,000	7,000	322,000	2,000	40,000
Wind Erosion Potential					
Moderate	141,000	15,000	534,000	50,000	172,000
Severe	4,000	22,000	41,000	12,000	121,000
Very Severe	0	4,000	100	100	15,000

Actions that allow game retrieval within 300 feet of a designated route and access to camp sites within 25 feet of a designated route would potentially result in expansion of soil surface disturbance beyond the designated route corridor. These actions would result in low density disturbances adjacent to designated

routes and would cause localized increases in soil erosion and bulk density and reductions in biological soil crust cover, especially with repeated use. Seasonal restrictions on vehicle use on primitive roads in the Herd Management Area (HMA) from March through July would reduce impacts by eliminating some use when soils are moist. Exemptions to motorized vehicle restrictions that would allow cross-country travel would lead to increased soil bulk density and vegetative cover removal in the areas where exemptions are granted.

Impacts from Management Specific to Alternative II

Under Alternative II, none of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The lack of open designation would eliminate impacts from cross-country motorized travel. Most of the acres with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion would be within areas where travel is limited to designated routes.

Wilderness and the Wilderness Study Area (WSA) would be closed to motorized vehicle use in Alternative II. This would protect soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion over half of the acreage of the No Action Alternative. The effects would be minimal at the planning area scale.

Table 4-34. Erosion Potential by Travel Designation in Alternative II (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	15,000	838,000	0
High	25,000	419,000	0
Wind Erosion Potential			
Moderate	28,000	883,000	0
Severe	200	199,000	0
Very Severe	0	19,000	0

Route density would be expected to increase in about 85% of the planning area primarily within the Bruneau Desert TMA to facilitate access for commercial uses. Most of the acreage in the Bruneau Desert TMA has soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. Impacts of increased route density within the Bruneau Desert TMA would be similar to impacts described for the No Action Alternative. Route density would be expected to remain the same in approximately 15% of the planning area, primarily within the Canyonlands TMA, to facilitate livestock grazing and mitigation for impacts to resources. Impacts within the Canyonlands TMA would be similar to those described for the Devil Creek TMA in Alternative I, and would only affect 16% of the soils with medium or higher potential for water erosion and 14% with moderate or higher potential for wind erosion. Unlimited motorized access off designated routes for game retrieval and within 100 feet of a designated route for camp site access in areas not closed to motorized use would result in impacts similar to those described in Alternative I, but would apply to most of the planning area. Exemptions to motorized vehicle restrictions that would allow cross-country travel would lead to increased soil bulk density and vegetative cover removal in the areas where exemptions are granted.

Table 4-35. Erosion Potential by Travel Management Area in Alternative II (Acres)

Erosion Potential	Bruneau Desert	Canyonlands
Change in Route Density	Increase	No Change
Water Erosion Potential		
Medium	741,000	112,000
High	371,000	72,000
Wind Erosion Potential		
Moderate	770,000	141,000
Severe	195,000	4,000
Very Severe	19,000	0

Impacts from Management Specific to Alternative III

Under Alternative III, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I. Most of the acreage with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion would be within areas where travel is limited to designated routes.

Areas closed to motorized vehicle use in Alternative III would be limited to the Salmon Falls Creek ACEC and the Bruneau and Jarbidge Rivers wilderness, which are physically restrictive to motorized transportation. Closed areas would protect soils with medium or greater potential for water erosion and moderate or greater potential for wind erosion over slightly more than half of the acreage of the No Action Alternative. These closed areas are small and isolated, and effects at the planning area scale would be minimal.

Table 4-36. Erosion Potential by Travel Designation in Alternative III (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	15,000	835,000	3,000
High	25,000	418,000	400
Wind Erosion Potential			
Moderate	28,000	881,000	2,000
Severe	200	198,000	1,000
Very Severe	0	19,000	100

Route density would be expected to increase in about 2% of the planning area, including within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I.

Route density would be expected to remain the same in about 98% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. These TMAs would be managed to improve access and facilitate wildland fire prevention and suppression. Therefore, management might not increase route density, but would improve surface condition. Improvement of road condition would result in wider disturbance areas adjacent to roads due to increased maintenance, including mowing of roadside areas. This would increase potential for soil surface erosion from the roadbed and roadside due to maintenance of fuel breaks. The Devil Creek TMA would have higher potential for water erosion and the Snake River TMA would have higher potential for wind erosion.

Table 4-37. Erosion Potential by Travel Management Area in Alternative III (Acres)

Erosion Potential	Deadman/ Yahoo	Devil Creek	Jarbidge Foothills	Snake River	West Side
Change in Route Density	Increase	No Change	No Change	No Change	No Change
Water Erosion Potential					
Medium	26,000	222,000	125,000	254,000	225,000
High	6,000	246,000	2,000	40,000	150,000
Wind Erosion Potential					
Moderate	14,000	372,000	50,000	164,000	310,000
Severe	16,000	34,000	12,000	123,000	14,000
Very Severe	3,000	100	100	15,000	0

Lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 25 feet of a designated route would reduce off-road disturbance relative to the No Action

Alternative and Alternatives I and II. Seasonal restrictions on vehicle use of primitive roads in the HMA from March through July would reduce vehicle impacts by eliminating some use when soils are moist. Exemptions to motorized vehicle restrictions that would allow cross-country travel would lead to increased soil bulk density and vegetative cover removal in the areas where exemptions are granted.

Impacts from Management Specific to Alternative IV

Under Alternative IV, less than 1% of the planning area would be open to cross-country motorized vehicle use, 93% would be limited to designated routes, and 7% would be closed to motorized vehicle use. The effects of open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I. Most of the acreage with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion would be within areas where travel is limited to designated routes. Closed areas under Alternative IV would include the wilderness, WSA, and Lands with Wilderness Characteristics. The effects would be similar to those described for Alternative I for areas with moderate or greater potential for wind erosion. Areas closed to motorized vehicle use in Alternative IV would protect soils with medium or greater potential for water erosion over 10 times more acres than in the No Action Alternative.

Table 4-38. Erosion Potential by Travel Designation in Alternative IV (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	50,000	799,000	3,000
High	25,000	418,000	400
Wind Erosion Potential			
Moderate	35,000	874,000	2,000
Severe	6,000	192,000	1,000
Very Severe	100	18,000	100

Lack of motorized access off designated routes for game retrieval and limiting motorized access to campsites to within 25 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions to motorized vehicle restrictions that would allow cross-country travel would lead to increased soil bulk density and vegetative cover removal in the areas where exemptions are granted.

Route density would be expected to increase in about 2% of the planning area, including within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in about 98% of the planning area, primarily within the Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs. The effects of route reduction would be similar to those described for Alternative I but would occur over double the area. The effects would be most prominent in the Devil Creek and Snake River TMAs, as these TMAs contain the greatest acres of soils prone to water or wind erosion.

Table 4-39. Erosion Potential by Travel Management Area in Alternative IV (Acres)

Erosion Potential	Canyonlands	Deadman/ Yahoo	Devil Creek	Jarbidge Foothills	Snake River
Change in Route Density	Decrease	Increase	Decrease	Decrease	Decrease
Water Erosion Potential					
Medium	112,000	26,000	326,000	125,000	264,000
High	72,000	6,000	322,000	2,000	41,000
Wind Erosion Potential					
Moderate	141,000	14,000	534,000	50,000	172,000
Severe	4,000	16,000	41,000	12,000	127,000
Very Severe	0	3,000	100	100	15,000

Impacts from Management Specific to Alternative V

Under Alternative V, less than 1% of the planning area would be open to cross-country motorized vehicle use, 88% would be limited to designated routes, and 12% would be closed to motorized vehicle use. The effects of designated open areas in the Yahoo SRMA, which coincides with the Yahoo TMA, would be similar to those described for Alternative I but would be spatially reduced by about 80%. The effects would be negligible at the planning area scale. Most of the acres with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion would be within areas where travel is limited to designated routes.

Table 4-40. Erosion Potential by Travel Designation in Alternative V (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	92,000	760,000	300
High	47,000	398,000	100
Wind Erosion Potential			
Moderate	81,000	830,000	100
Severe	7,000	192,000	200
Very Severe	100	18,000	100

Closed areas under Alternative V would include the wilderness, Lower Salmon Falls Creek WSA and Lands with Wilderness Characteristics. The effects would be similar to those described for Alternative I; however, Alternative V would protect soils with medium or greater potential for water erosion on 24 times more acres compared to the No Action Alternative. For soils with moderate or greater potential for wind erosion, 18 times more acres would be protected compared to the No Action Alternative.

Route density would be expected to increase in less than 1% of the planning area, primarily within the Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Yahoo TMA would be similar to impacts described for Alternative I, but would apply to less than 10% of the area with increased route density in Alternative I.

Route density would be expected to decrease in about 99% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. Route reduction in Alternative V would do the most of all the alternatives to facilitate reductions in soil erosion and bulk density, as it would affect most of the area with soils prone to erosion. Since the density of routes within the planning area would be reduced, lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 25 feet of a designated route would reduce off-road disturbance to the greatest degree of all the alternatives. Application of motorized vehicle restrictions to lessees, BLM permit holders, and right-of-way holders would reduce the potential for impacts associated with cross country travel most of all alternatives.

Table 4-41. Erosion Potential by Travel Management Area in Alternative V (Acres)

Erosion Potential	Devil Creek	Jarbidge Foothills	Snake River	West Side	Yahoo
Change in Route Density	Decrease	Decrease	Decrease	Decrease	Increase
Water Erosion Potential					
Medium	222,000	125,000	278,000	225,000	2,000
High	246,000	2,000	46,000	150,000	500
Wind Erosion Potential					
Moderate	372,000	50,000	178,000	310,000	600
Severe	34,000	12,000	138,000	15,000	1,000
Very Severe	100	100	18,000	0	200

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman SRMA would be similar to those described for the Deadman/Yahoo TMA for Alternative I. Most of the acreage with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion would be within areas where travel is limited to designated routes.

Areas closed to motorized vehicle use in Alternative VI would be limited to the Salmon Falls Creek ACEC, the WSA, and the wilderness, which are physically restrictive to motorized transportation.

Table 4-42. Erosion Potential by Travel Designation in Alternative VI (Proposed RMP) (Acres)

Erosion Potential	Closed	Limited to Designated Routes	Open
Water Erosion Potential			
Medium	15,000	835,000	3,000
High	25,000	418,000	400
Wind Erosion Potential			
Moderate	28,000	881,000	2,000
Severe	200	198,000	1,000
Very Severe	0	18,000	100

Lack of motorized access off designated routes for game retrieval and limiting motorized access to campsites within 100 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions to motorized vehicle restrictions that would allow cross-country travel would lead to increased soil bulk density and vegetative cover removal in areas where exemptions are granted.

Route density would be expected to increase in about 3% of the planning area, including within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in about 10% of the planning area, primarily within the Jarbidge Foothills. Route density would remain unchanged within 87% of the planning area, primarily in the Canyonlands, Devil Creek, and Snake River TMAs. The effects of route reduction would be similar to those described for Alternative I but would occur over fewer acres.

Table 4-43. Erosion Potential by Travel Management Area in Alternative VI (Proposed RMP) (Acres)

Erosion Potential	Canyonlands	Deadman/ Yahoo	Devil Creek	Jarbidge Foothills	Snake River
Change in Route Density	No Change	Increase	No Change	Decrease	No Change
Water Erosion Potential					
Medium	94,000	26,000	334,000	125,000	273,000
High	66,000	7,000	329,000	2,000	40,000
Wind Erosion Potential					
Moderate	123,000	14,000	546,000	50,000	178,000
Severe	1,000	17,000	41,000	12,000	128,000
Very Severe	0	3,000	100	100	16,000

Impacts from Land Use Authorizations Actions

The following indicators were used to analyze impacts of Land Use Authorizations actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Land use authorizations typically have multiple components. These components may include infrastructure such as buildings, power transmission lines, meteorological towers, wind turbines, and access roads. Construction of infrastructure components typically includes road improvement for use by heavy equipment. Buried cable or pipelines would result in disturbance of soils from trenching as well as access roads. Authorizations would include clearing areas of vegetation around structures and gravelling to reduce wildland fire and provide parking. Rights-of-way (ROWs) for roads, above-ground utility lines, buried utility lines or pipelines, or other linear facilities are highly variable regarding size of disturbance and type of access route. Installation and maintenance of utility lines results in linear disturbance resulting from construction of the utility line, formation and maintenance of primitive roads through repeated use, or construction and maintenance of improved roads. Areas of new construction would have increased potential for soil erosion due to loss of vegetative cover and increases in soil bulk density where heavy equipment is used. Roads used for maintenance would have increased erosion potential and bulk density due to repeated use. Installation of buried utility lines or pipelines would have increased erosion potential due to disruption of the soil profile.

Impacts of wind energy developments to soils would include excavation for placement of meteorological towers, wind turbines, substation and maintenance facilities, power transmission lines, and construction, use, and maintenance of roads. Impacts to soils for construction, use, and maintenance of meteorological towers would include increased soil bulk density and removal of soil cover. Impacts to soils for construction, use, and maintenance of wind turbines, substation and maintenance facilities, and power transmission lines would be similar but would be larger in scale. Specific impacts to soils would be analyzed in detail for individual projects. Impacts of construction, use, and maintenance of access roads would be the same as impacts described for road ROWs above.

Maintenance of structures requires at least one access route. Access routes may be graveled or of native surface, depending on the frequency, season, and type of maintenance needed. Effects of ROWs granted to provide access to Federal, State or private land are usually limited to construction, use, and maintenance of roads. Table 4-44 and Table 4-45 display soil erosion potential in the utility ROW corridors and expected wind development areas by alternative.

Table 4-44. Erosion Potential in Utility Right-of-Way Corridors by Alternative (Acres)

Erosion Potential	Alternative						
	No Action	I	II	III	IV	V	VI
Water Erosion Potential							
Medium	20,000	25,000	25,000	25,000	25,000	25,000	27,000
High	6,000	24,000	24,000	24,000	24,000	24,000	12,000
Wind Erosion Potential							
Moderate	12,000	32,000	32,000	32,000	32,000	32,000	19,000
Severe	15,000	16,000	16,000	16,000	16,000	16,000	20,000
Very Severe	2,000	2,000	2,000	2,000	2,000	2,000	2,000

Table 4-45. Erosion Potential in Expected Wind Development Areas by Alternative (Acres)

Erosion Potential	Alternative						
	No Action	I	II	III	IV	V	VI
Water Erosion Potential							
Medium	90,000	29,000	106,000	37,000	26,000	22,000	14,000
High	14,000	8,000	12,000	8,000	7,000	6,000	5,000
Wind Erosion Potential							
Moderate	44,000	16,000	48,000	23,000	15,000	11,000	9,000
Severe	33,000	18,000	34,000	19,000	18,000	17,000	10,000
Very Severe	1,000	1,000	2,000	1,000	1,000	1,000	1,000

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the utility ROW corridors consist of 30,000 acres, (2% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The utility ROW corridors would affect up to 2% of the planning area with soils in these erosion potential categories.

Under the No Action Alternative, the expected wind energy development areas consist of 111,000 acres, (8% of the planning area). Approximately 94% of this area has medium or greater potential for water erosion; about 70% has moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 13% of soils in these erosion potential categories.

Management direction in the No Action Alternative restricts new communication sites and facilities to existing locations as much as possible. This would limit impacts to soils due to construction and maintenance activities. Placement of communication sites and facilities at new locations would likely require new access roads and pads. Impacts due to construction of new communication sites and facilities would be localized and would consist primarily of soil erosion in areas where vegetation is removed for access route construction or facility installation and increased bulk density due to access route construction, use, and maintenance.

Soil erosion and increased bulk density impacts associated with authorized agricultural uses or trespasses would likely be small in size and have a negligible effect at the scale of the planning area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

BLM wind development program policies and best management practices would generally reduce the overall impacts to soils to some degree. For example, road removal would result in short-term disturbance due to ripping or recontouring, resulting in increased potential for soil erosion. Long-term effects of road removal would include decreases in soil erosion and bulk density due to re-establishment of vegetative cover (Switalski et al., 2004). Management actions common to the No Action Alternative and all action alternatives would generally reduce impacts to soils by encouraging location of new ROWs and communication sites within existing disturbed corridors or sites. This would reduce the number of new access roads and pads and subsequently reduce soil erosion and bulk density impacts associated with those developments.

Impacts from Management Specific to Alternative I

Under Alternative I, the utility ROW corridors consist of 53,000 acres, 4% of the planning area. Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The utility ROW corridors would affect up to 4% of the area with soils in these erosion potential categories.

The expected wind energy development area consists of 39,000 acres, 3% of the planning area. Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 6% of the acreage with soils in these classifications. Impacts of wind energy developments to soils would occur on 6% of the planning area. Wind energy would be encouraged in areas with annual grassland or non-native perennial grass

communities. These areas have been altered by wildland fire or other disturbances, resulting in changes in vegetation composition, including biological soil crust cover, and plant community structure.

The effects to soils resulting from activities associated with construction, use, and maintenance of communication sites and facilities authorized within ROWs would be similar to those described for the No Action Alternative, but would occur over a slightly smaller geographic area. Seasonal restrictions for construction or maintenance on land use authorizations tend to minimize impacts to soils during periods when soils would be moist or wet and more prone to compaction or rutting. However, repeated use during dry periods would increase soil bulk density in localized areas. These impacts are expected to be restricted to routes and infrastructure locations. At the landscape scale, the expected impact area for soils is minor.

Impacts from Management Specific to Alternative II

Under Alternative II, the utility ROW corridors consist of 53,000 acres, (4% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The utility ROW corridors would affect up to 4% of the area with soils in these erosion potential categories.

The expected wind energy development area consists of 127,000 acres, (9% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 17% of the acreage with soils in these classifications. Impacts of wind developments to soils would occur on a slightly larger geographic area than in the No Action Alternative.

The effects of activities associated with construction, use, and maintenance of communication sites and ROWs on soils would occur over a slightly larger area than the No Action Alternative.

Impacts from Management Specific to Alternative III

Under Alternative III, the utility ROW corridors consist of 53,000 acres, (4% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The utility ROW corridors would affect up to 4% of the area with soils in these erosion potential categories.

The expected wind energy development area consists of 50,000 acres, (4% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 7% of the acreage with soils in these classifications.

The effects of activities associated with construction, use, and maintenance of communication sites and ROWs on soils would be the same as those described for Alternative I.

Impacts from Management Specific to Alternative IV

The utility ROW corridors consist of 53,000 acres, 4% of the planning area. Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The utility ROW corridors would affect up to 4% of the area with soils in these erosion potential categories.

The expected wind energy development area consists of 37,000 acres, 3% of the planning area. Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 6% of the acreage with soils in these classifications.

The effects of activities associated with construction, use, and maintenance of communication sites and ROWs on soils would occur over a slightly smaller area than in Alternative I.

Impacts from Management Specific to Alternative V

The utility ROW corridors consist of 53,000 acres, (4% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The utility ROW corridors would affect up to 4% of the area with soils in these erosion potential categories.

The expected wind energy development area consists of 31,000 acres, (2% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 6% of the acreage with soils in these classifications.

The effects of activities associated with construction, use, and maintenance of communication sites and ROWs on soils would occur over a slightly smaller area than in Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The expected utility ROW corridor consists of 43,000 acres, (3% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion.

The expected wind energy development area consists of 22,000 acres, (2% of the planning area). Most of this area has medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The expected wind energy development area would affect up to 6% of the acreage with soils in these classifications.

The effects to soils resulting from activities associated with construction, use, and maintenance of communication sites and facilities authorized within ROWs would be similar to those described for the No Action Alternative, but would occur over a smaller geographic area. Seasonal restrictions for construction or maintenance on land use authorizations tend to minimize impacts to soils during periods when soils would be moist or wet and more prone to compaction or rutting. However, repeated use during dry periods would increase soil bulk density in localized areas. These impacts are expected to be restricted to routes and infrastructure locations. At the landscape scale, the expected impact area for soils is minor.

ROWs for power generation (less than one megawatt), utility lines, or attendant roads for residential or farm use would be considered throughout the planning area consistent with stipulations for ROW avoidance areas and outside ROW exclusion areas. This would result in increased potential for erosion and increased soil bulk density over small areas and would be considered negligible on a landscape level.

Impacts from Minerals Actions

The following indicators were used to analyze impacts of Mineral actions on soil resources:

- Potential for erosion on soils with erosion hazard ratings of medium or greater potential for water erosion and/or moderate or greater erosion potential for wind erosion;
- The amount and type of soil cover; and
- Soil bulk density.

Surface occupancy for leasable, salable, and locatable mineral extraction would include some or all of the following developments and activities: removal of surface vegetation, alteration of landforms, construction of new or maintenance and use of existing transportation routes, heavy equipment operations, presence of personnel, overhead power lines, surface piping, access restrictions, and permanent structures. Applications would be subject to detailed analysis.

Exploration activities would likely utilize existing roads but would require cross-country motorized travel. This would disturb vegetation in localized areas but would not likely result in increased erosion or bulk density unless locations are accessed repeatedly. Test well drilling would result in vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. Areas of new construction, including improvement of primitive roads, would have increased potential for soil erosion due to loss of vegetative cover and increases in soil bulk density where heavy equipment is used. Access

roads would have increased erosion potential and bulk density due to repeated use. Pads and access roads for unproductive, reclaimed test sites would have increased erosion potential for two to five years until establishment of seeded vegetation. Increased bulk density in heavily used areas would persist for several years.

Impacts from Management Specific to the No Action Alternative

The majority of the planning area would be open for oil and gas leasing and geothermal leasing. The Bruneau-Jarbidge Rivers Wilderness and the Lower Salmon Falls Creek Wilderness Study Area would be closed. There would be no impacts to soils in areas closed to leasing or open with no surface occupancy (NSO) restrictions. Areas open to mineral leasing utilizing surface occupancy would be more likely to have some level of soil surface disturbance that would result in increased soil erosion or soil bulk density due to activities associated with exploration, test well drilling, and field development. Effects associated with construction, use, and maintenance of facilities and roads would occur at a greater density over a larger acreage. The scale of impacts to soils with medium or greater potential for water and/or moderate or greater potential for wind erosion cannot be characterized due to lack of spatial specificity of potential leasing areas. However, the disturbed area would not necessarily be proportional to the size of the designated open area. Surface disturbance acreage associated with oil and gas exploration and development activities would likely be less than 1% of the planning area (Appendix K). Surface disturbance acreage associated with geothermal exploration and development activities would likely be less than 1% of the planning area (Appendix L).

Seasonal restrictions for potential oil and gas and geothermal activities would minimize impacts to soils during periods when soils would be moist or wet (October through June) and more prone to compaction or rutting. However, repeated use during dry periods would increase soil bulk density in localized areas. These impacts are expected to be generally restricted to routes and infrastructure locations.

The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. Individual sites would have some level of soil surface disturbance that would result in increased soil erosion or soil bulk density due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. Since affected areas are expected to be less than 100 acres each, impacts to soils are expected to be occur on less than 1% of the planning area

Under the No Action Alternative, 218,000 acres, 16% of the planning area, would be recommended for withdrawal from locatable mineral entry. This would include acres in the Sand Point Area of Critical Environmental Concern and in the vicinity of the Oregon Trail that are rated as having severe to very severe potential for wind erosion. Erosion potential would be locally reduced in these areas. About 84% of the planning area would have potential for some level of soil surface disturbance from locatable mineral activities that would result in increased soil erosion or soil bulk density due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. It is unlikely that disturbance would be proportional to the area open for development. Based on the lack of known, large, economically viable deposits and history of locatable mineral development in the planning area, impacts to soils from locatable minerals are anticipated to occur on less than 1% of the planning area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Management common to the No Action and all action alternatives promotes the use of existing mineral sites. This would reduce potential surface disturbance within the planning area and the need to develop access routes to new locations.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives would minimize soil erosion potential through requirements to recontour disturbed areas to match natural landforms; stabilize surface soils through seeding, mulching, and drainage; and divert runoff water onto areas with vegetation capable of filtering runoff, or pass through settling basins.

Impacts from Management Specific to Alternative I

Under Alternative I, 295,000 acres (22% of the planning area) would be open and have potential for oil and gas leasing. There would be no impacts to soils in areas closed to leasing or open with NSO. Areas open to mineral leasing utilizing surface occupancy would be more likely to have some level of soil surface disturbance that would result in increased soil erosion and/or soil bulk density due to activities associated with exploration, test well drilling, and field development. The effects associated with construction, use, and maintenance of facilities and roads would occur at a greater density over a larger acreage. The disturbed area would not necessarily be proportional to the size of the designated open area. Surface disturbance acreage associated with exploration and development activities would likely be less than 1% of the planning area (Appendix K).

Table 4-46. Mineral Allocations by Erosion Potential in Alternative I (Acres)

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Closed	11,000	7,000	1,000	1,000	5,000	1,000
Open with NSO	19,000	14,000	4,000	9,000	8,000	100
Acres with No Impacts	**30,000**	**21,000**	**5,000**	**10,000**	**13,000**	**1,100**
Open	187,000	145,000	29,000	76,000	94,000	13,000
Open with Seasonal Restrictions	89,000	72,000	10,000	33,000	12,000	100
Acres with Impacts	**276,000**	**217,000**	**39,000**	**109,000**	**106,000**	**13,100**
Potential Geothermal Areas						
Closed	14,000	9,000	400	1,000	8,000	1,000
Open with NSO	17,000	13,000	3,000	8,000	8,000	200
Acres with No Impacts	**31,000**	**22,000**	**3,400**	**9,000**	**16,000**	**1,200**
Open	328,000	266,000	46,000	175,000	128,000	17,000
Open with Seasonal Restrictions	8,000	6,000	2,000	6,000	1,000	0
Acres with Impacts	**336,000**	**272,000**	**48,000**	**181,000**	**129,000**	**17,000**
Salable Mineral Allocations						
Closed (No Impacts)	171,000	84,000	54,000	95,000	15,000	500
Open (Impacts)	1,200,000	768,000	389,000	816,000	184,000	18,000
Locatable Mineral Allocations						
Recommended for Withdrawal (No Impacts)	69,000	48,000	8,000	29,000	14,000	1,000
Withdrawn by Statute (No Impacts)	60,000	15,000	25,000	28,000	200	0

Under Alternative I, 352,000 acres, 26% of the planning area, would be open and have medium to high potential for geothermal leasing. There would be no impact to soils in areas closed to leasing or open with NSO. Areas open to geothermal leasing utilizing surface occupancy would be more likely to have some level of soil surface disturbance that would result in increased soil erosion and/or soil bulk density due to activities associated with exploration, test well drilling, and facility development.

Seasonal restrictions for leasing would tend to reduce impacts to soils during periods when soils would be moist or wet (October through June) and more prone to compaction or rutting. However, repeated use during dry periods would increase soil bulk density in localized areas. These impacts are expected to be generally restricted to routes and infrastructure locations.

Under Alternative I, most of the planning area would be open for salable mineral development; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. Areas closed to salable mineral development would eliminate impacts on up to 13% of acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. Open areas would be more likely to have some level of soil surface disturbance that would result in increased soil erosion and/or soil bulk density due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. However, the disturbed area is expected to be small relative to the designated open area. The effects are likely to be local and small in scale relative to the planning area.

Alternative I would recommend approximately 5% of the planning area for withdrawal from locatable mineral development. Combined with areas withdrawn by statute, this would eliminate potential for impacts due to construction, use, and maintenance of facilities and roads on up to 10% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. Open areas would be likely to have some level of soil surface disturbance that would result in increased soil erosion and/or soil bulk density due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads associated with locatable mineral development. However, the disturbed area is expected to be small relative to the designated open area. Effects are likely to be local and small in scale relative to the planning area.

It is unlikely that disturbance would be proportional to the area open for development. Based on the lack of known, large, economically viable deposits and history of locatable mineral development in the planning area, impacts to soils from locatable minerals are anticipated to occur on less than 1% of the planning area.

Impacts from Management Specific to Alternative II

Under Alternative II, 306,000 acres (22% of the planning area) would be open and have potential for oil and gas leasing. Effects of oil and gas exploration, testing, and development would potentially occur over a slightly larger area than in Alternative I. This area would include increased acreage of soils with severe to very severe potential for wind erosion. Lack of seasonal restrictions would increase the potential for elevated soil erosion and bulk density during periods when soils would be moist or wet.

Table 4-47. Mineral Allocations by Erosion Potential in Alternative II (Acres)

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Closed	100	0	0	0	0	0
Open with NSO	14,000	11,000	2,000	3,000	8,000	400
Acres with No Impacts	**14,100**	**11,000**	**2,000**	**3,000**	**8,000**	**400**
Open	293,000	228,000	40,000	114,000	111,000	14,000
Open with Seasonal Restrictions	0	0	0	0	0	0
Acres with Impacts	**293,000**	**228,000**	**40,000**	**114,000**	**111,000**	**14,000**
Potential Geothermal Areas						
Closed	1,000	0	0	400	3,000	0
Open with NSO	13,000	10,000	2,000	3,000	6,000	400
Acres with No Impacts	**14,000**	**10,000**	**2,000**	**3,400**	**9,000**	**400**
Open	353,000	283,000	49,000	187,000	136,000	17,000
Open with Seasonal Restrictions	0	0	0	0	0	0
Acres with Impacts	**353,000**	**283,000**	**49,000**	**187,000**	**136,000**	**17,000**

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Salable Mineral Allocations						
Closed (No Impacts)	89,000	32,000	33,000	44,000	10,000	0
Open (Impacts)	1,282,000	820,000	410,000	867,000	189,000	19,000
Locatable Mineral Allocations						
Recommended for Withdrawal (No Impacts)	26,000	16,000	3,000	7,000	9,000	400
Withdrawn by Statute (No Impacts)	60,000	15,000	25,000	28,000	200	0

Under Alternative II, 365,000 acres (27% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts for geothermal exploration and development would be similar to those described for Alternative I, but would potentially occur over a slightly larger area. This area would include increased acreage of soils with severe to very severe potential for wind erosion. Lack of seasonal restrictions would increase the potential for elevated soil erosion and bulk density during periods when soils would be moist or wet.

Under Alternative II, the area open for salable mineral development would be 107% of the acres open under Alternative I; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 3,300 acres over the life of the plan. This would slightly increase the potential for effects to soils due to construction, use, and maintenance of facilities and roads relative to Alternative I. Areas closed to development would eliminate impacts on 7% of acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion.

Alternative II would recommend 37% (26,000 acres) of the acreage recommended in Alternative I for withdrawal from locatable mineral development. This would eliminate impacts due to construction, use, and maintenance of facilities and roads on up to 7% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion when combined with areas withdrawn by statute. Potential for impacts to soils from locatable mineral development would be greater under Alternative II compared to Alternative I.

Impacts from Management Specific to Alternative III

Under Alternative III, 301,000 (22% of the planning area) would be open and have potential for oil and gas leasing. The effects of oil and gas exploration, testing, and development and lack of seasonal restrictions would be similar to those described for Alternative II.

Under Alternative III, 361,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts from geothermal exploration and development and lack of seasonal restrictions would be similar to those described for Alternative II.

Table 4-48. Mineral Allocations by Erosion Potential in Alternative III (Acres)

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Closed	5,000	4,000	0	0	2,000	300
Open with NSO	9,000	8,000	2,000	3,000	6,000	200
Acres with No Impacts	**14,000**	**12,000**	**2,000**	**3,000**	**8,000**	**500**
Open	292,000	226,000	41,000	114,000	111,000	14,000

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Open with Seasonal Restrictions	0	0	0	0	0	0
Acres with Impacts	**292,000**	**226,000**	**41,000**	**114,000**	**111,000**	**14,000**
Potential Geothermal Areas						
Closed	5,000	3,000	0	400	3,000	300
Open with NSO	9,000	8,000	2,000	3,000	6,000	200
Acres with No Impacts	**14,000**	**11,000**	**2,000**	**3,400**	**9,000**	**500**
Open	352,000	283,000	49,000	187,000	137,000	18,000
Open with Seasonal Restrictions	0	0	0	0	0	0
Acres with Impacts	**352,000**	**283,000**	**49,000**	**187,000**	**137,000**	**18,000**
Salable Mineral Allocations						
Closed (No Impacts)	105,000	42,000	34,000	50,000	11,000	500
Open (Impacts)	1,266,000	811,000	409,000	861,000	188,000	18,000
Locatable Mineral Allocations						
Recommended for Withdrawal (No Impacts)	28,000	17,000	3,000	8,000	9,000	400
Withdrawn by Statute (No Impacts)	60,000	15,000	25,000	28,000	200	0

Under Alternative III, the area open to salable mineral development would be 105% of the acreage open under Alternative I; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 3,300 acres over the life of the plan. Areas closed to development would eliminate impacts on 8% of acres of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. This would reduce potential impacts to soils to a greater extent than Alternatives I or II.

Alternative III would recommend for withdrawal from locatable mineral development 41% (28,000 acres) of the acreage recommended in Alternative I. This would eliminate impacts due to construction, use, and maintenance of facilities and roads on 21% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion when combined with areas withdrawn by statute. Potential for impacts to soils from locatable mineral development would be greater under Alternative III compared to Alternative I, but less than Alternative II.

Impacts from Management Specific to Alternative IV

Under Alternative IV, 272,000 acres (20% of the planning area) would be open and have potential for oil and gas leasing. The effects of oil and gas exploration, testing, and development would potentially occur over a slightly smaller area than in Alternative I. Under Alternative IV, there would be lower potential for effects to soils with medium risk for water erosion, but higher potential for effects to soils with very severe risk for wind erosion.

Under Alternative IV, 358,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts for geothermal exploration and development would potentially occur over a slightly larger area than in Alternative I. Under Alternative IV, there would be increased potential for effects to soils with very severe risk for wind erosion.

Table 4-49. Mineral Allocations by Erosion Potential in Alternative IV (Acres)

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Closed	35,000	33,000	0	6,000	8,000	400
Open with NSO	19,000	14,000	4,000	9,000	8,000	300
Acres with No Impacts	**54,000**	**47,000**	**4,000**	**15,000**	**16,000**	**700**
Open	193,000	149,000	29,000	77,000	97,000	14,000
Open with Seasonal Restrictions	60,000	44,000	10,000	26,000	6,000	< 100
Acres with Impacts	**253,000**	**193,000**	**39,000**	**103,000**	**103,000**	**14,000**
Potential Geothermal Areas						
Closed	8,000	6,000	100	1,000	5,000	300
Open with NSO	17,000	13,000	3,000	8,000	8,000	300
Acres with No Impacts	**25,000**	**19,000**	**3,100**	**9,000**	**13,000**	**600**
Open	334,000	268,000	46,000	176,000	131,000	18,000
Open with Seasonal Restrictions	8,000	6,000	1,000	6,000	2,000	0
Acres with Impacts	**342,000**	**274,000**	**47,000**	**182,000**	**133,000**	**18,000**
Salable Mineral Allocations						
Alternative IV-A						
Closed (No Impacts)	268,000	154,000	81,000	165,000	20,000	600
Open (Impacts)	1,103,000	699,000	363,000	746,000	179,000	18,000
Alternative IV-B						
Closed (No Impacts)	236,000	133,000	70,000	134,000	20,000	600
Open (Impacts)	1,135,000	719,000	374,000	777,000	179,000	18,000
Locatable Mineral Allocations						
Recommended for Withdrawal (No Impacts)	83,000	51,000	21,000	45,000	11,000	400
Withdrawn by Statute (No Impacts)	60,000	15,000	25,000	28,000	200	0

Under Alternative IV-A, the area open to salable mineral development would be 92% of the acreage open under Alternative I; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. Areas closed to development would eliminate potential for impacts on 21% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The effects of potential development would occur on a slightly smaller geographic area than in Alternative I. This would reduce potential impacts to soils to a greater extent than Alternatives I, II, or III.

Under Alternative IV-B, the area open to salable mineral development would be 95% of the acreage open under Alternative I; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. Areas closed to development would eliminate potential for impacts on 18% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The effects of potential development would occur on a slightly smaller geographic area than in Alternative I. This would reduce potential impacts to soils to a greater extent than Alternatives I, II, or III, but not as much as Alternative IV-A.

Alternative IV would recommend 120% (83,000 acres) of the acreage recommended in Alternative I for withdrawal from locatable mineral development. Combined with areas withdrawn by statute, this would

eliminate potential for impacts due to construction, use, and maintenance of facilities and roads on up to 11% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. Potential for impacts to soils from locatable mineral development would be less than for Alternatives I, II, and III.

Impacts from Management Specific to Alternative V

Under Alternative V, 266,000 acres (19% of the planning area) would be open and have potential for oil and gas leasing. The effects of oil and gas exploration, testing, and development would potentially occur on the smallest area of all the alternatives.

Under Alternative V, 360,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts for geothermal exploration and development would be similar to those described for Alternative I.

Table 4-50. Mineral Allocations by Erosion Potential in Alternative V (Acres)

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Closed	41,000	36,000	300	7,000	11,000	1,000
Open with NSO	19,000	14,000	4,000	9,000	8,000	200
Acres with No Impacts	**60,000**	**50,000**	**4,300**	**16,000**	**19,000**	**1,200**
Open	211,000	160,000	36,000	90,000	96,000	13,000
Open with Seasonal Restrictions	36,000	30,000	2,000	12,000	5,000	0
Acres with Impacts	**247,000**	**190,000**	**38,000**	**102,000**	**101,000**	**13,000**
Potential Geothermal Areas						
Closed	12,000	7,000	400	1,000	6,000	1,000
Open with No Surface Occupancy	17,000	13,000	3,000	8,000	8,000	200
Acres with No Impacts	**29,000**	**20,000**	**3,400**	**9,000**	**14,000**	**1,200**
Open	335,000	272,000	47,000	180,000	131,000	17,000
Open with Seasonal Restrictions	2,000	1,000	0	1,000	1,000	0
Acres with Impacts	**337,000**	**272,000**	**47,000**	**181,000**	**132,000**	**17,000**
Salable Mineral Allocations						
Closed (No Impacts)	209,000	118,000	55,000	100,000	21,000	2,000
Open (Impacts)	1,162,000	734,000	388,000	811,000	178,000	17,000
Locatable Mineral Allocations						
Recommended for Withdrawal (No Impacts)	33,000	20,000	3,000	8,000	11,000	1,000
Withdrawn by Statute (No Impacts)	60,000	15,000	25,000	28,000	200	0

Under Alternative V, the area open to salable mineral development would be 99% of the acreage open under Alternative I; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. Effects due to open designation would be similar to the No Action Alternative. Areas closed to development would eliminate impacts on 16% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. This would reduce potential impacts to soils to a greater extent than Alternatives I, II, or III, but not as much as Alternatives IV-A or IV-B.

Alternative V would recommend 48% (33,000 acres) of the acreage recommended in Alternative I for withdrawal from locatable mineral development. Combined with areas withdrawn by statute, this would eliminate potential for impacts due to construction, use, and maintenance of facilities and roads on 7% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The effects of potential development would be similar to those described for Alternative I. Potential for impacts to soils from locatable mineral development would be greater under Alternative V compared to Alternatives I, III, and IV, but less than Alternative II.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 302,000 acres (22% of the planning area) would be open and have potential for oil and gas leasing. The effects of oil and gas exploration, testing, and development would potentially occur over a slightly larger area than in Alternative I.

Under Alternative VI, 360,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts for geothermal exploration and development would potentially occur over a slightly larger area than in Alternative I.

Table 4-51. Mineral Allocations by Erosion Potential in Alternative VI (Proposed RMP) (Acres)

Mineral Allocations	Total Acres	Water Erosion Potential		Wind Erosion Potential		
		Medium	High	Moderate	Severe	Very Severe
Leasable Mineral Allocations						
Potential Oil and Gas Areas						
Closed	5,000	4,000	0	300	2,000	300
Open with NSO	19,000	14,000	4,000	9,000	8,000	100
Acres with No Impacts	**24,000**	**28,000**	**4,000**	**9,300**	**10,000**	**400**
Open	194,000	148,000	29,000	77,000	97,000	14,000
Open with Seasonal Restrictions	89,000	72,000	9,000	31,000	12,000	100
Acres with Impacts	**283,000**	**220,000**	**38,000**	**108,000**	**109,000**	**14,100**
Potential Geothermal Areas						
Closed	5,000	4,000	100	500	3,000	300
Open with NSO	17,000	13,000	3,000	8,000	8,000	300
Acres with No Impacts	**22,000**	**17,000**	**3,100**	**8,500**	**11,000**	**600**
Open	327,000	265,000	43,000	169,000	131,000	17,000
Open with Seasonal Restrictions	16,000	12,000	4,000	13,000	3,000	0
Acres with Impacts	**343,000**	**277,000**	**47,000**	**182,000**	**134,000**	**17,000**
Salable Mineral Allocations						
Closed (No Impacts)	121,000	53,000	36,000	57,000	12,000	500
Open (Impacts)	1,250,000	800,000	407,000	854,000	187,000	18,000
Locatable Mineral Allocations						
Recommended for Withdrawal (No Impacts)	0	0	0	0	0	0
Withdrawn by Statute (No Impacts)	60,000	15,000	25,000	28,000	200	0

Impacts from seasonal restrictions for oil and gas leasing and geothermal exploration and development would be similar to those described for Alternative I, but would apply over 64% of the planning area.

Under Alternative VI, the area open to salable mineral development would be 104% of the acreage open under Alternative I; the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. Areas closed to development would eliminate impacts on 9% of the acreage of soils with medium or greater potential for water erosion and/or moderate or greater potential for wind erosion. The effects of potential development would occur on a slightly larger geographic area than in Alternative I. This would reduce potential impacts to soils to a greater extent than the No Action Alternative and Alternatives II and III, but less than Alternatives I, IV-A, IV-B, and V.

Alternative VI would not recommend any acreage for withdrawal from locatable mineral development. Potential for impacts to soils from locatable mineral development would be the greatest out of all action alternatives.

Summary of Direct and Indirect Impacts

Ratings of each alternative are intended to convey how well each alternative maintains or improves soil resource conditions based on the indicators. Ratings are for comparison purposes only and are not meant to be additive by alternative or to provide a measure of significance between alternatives. Alternatives were qualitatively rated for each Chapter 2 section based on the following criteria:

- *Soil Resources* – The ability to reduce potential for soil erosion and improve soil functions such as nutrient and water cycling.
- *Upland Vegetation Communities* – The ability to reduce the potential for soil erosion and bulk density and improve soil functions such as nutrient and water cycling.
- *Wildland Fire Ecology and Management* – critical suppression areas and the ability to reduce soil impacts due to burning, suppression, and fuels reduction activities.
- *Livestock Grazing* – The ability to reduce soil impacts due to livestock grazing activities and infrastructure.
- *Transportation and Travel* – Anticipated route density within the planning area and the ability to reduce soil impacts due to travel management designations.
- *Land Use Authorizations* – Potential development and the ability to reduce soil impacts due to construction, use, and maintenance of facilities and access for rights-of-way.
- *Minerals* – Potential development for leasable, salable, and locatable minerals and the ability to reduce soil impacts due to construction, use, and maintenance of facilities and access.

Impacts from the No Action Alternative

The No Action Alternative would do the least of all alternatives to reduce impacts to soil resources throughout the planning area. The No Action Alternative lacks specific actions that would be incorporated at the implementation level as design features, stipulations, or closures to manage for soils, particularly soils with higher hazard ratings for water and wind erosion. Overall, the No Action Alternative would result in moderate adverse impacts over the short and long term.

Impacts from Alternative I

Alternative I was rated fifth overall for reducing impacts to soil resources. Management actions under Alternative I would tend to moderate impacts to soil resources while allowing for multiple uses. Alternative I would tend to maintain current conditions in the short term with minor beneficial impacts to soil resource conditions over the long term.

Impacts from Alternative II

Alternative II was rated seventh overall for reducing impacts to soil resources. Alternative II allows for the highest level of resource use and maintains the vegetation of the planning area in non-native perennial grasslands. This vegetation community type would be relatively stable and provide cover to reduce loss of surface soils. However, higher livestock grazing allocations as well as anticipated increased number and density of livestock facilities would tend to reduce cover and would compact soils in facility locations. Alternative II also allows for increased access for recreation, commodity use, and mineral extraction. Impacts associated with roads would tend to increase erosion potential; density of roads would increase

soil bulk density over the proportion of soils compacted by use. Overall, Alternative II would result in moderate adverse impacts on soil resource conditions over the long term.

Impacts from Alternative III

Alternative III was rated sixth overall for reducing impacts to soil resources. Management actions under Alternative III focus primarily on creating conditions to improve wildland fire suppression activities and reduce fire size. Less wildland fire on the landscape would reduce impacts to soils, resulting in moderate beneficial impacts. The actions under Alternative III would result in an increase in short- and long-term impacts resulting primarily from construction, use, and maintenance of roads and wildland fire suppression facilities; creation and maintenance of fire breaks and fire-resistant plant communities; and use of livestock grazing to reduce fuels. Soil resources would also potentially be affected by higher levels of mineral development. Those actions would result in localized, major adverse impacts over the long term.

Impacts from Alternative IV

Alternative IV does the most of all the alternatives to reduce impacts to soil resources throughout the planning area. Alternative IV contains specific actions that would be incorporated at the implementation level as design features, stipulations, and closures to manage for soils, and particularly soils with higher hazard ratings for water and wind erosion. Alternative IV-A would provide management to reduce soil impacts through upland vegetation treatments to restore native shrubland communities, wildland fire management priorities that protect existing and restored native shrubland communities, reductions in livestock grazing allocations and facilities, and limits on transportation and travel allocations, land use authorizations, and mineral development. Impacts from Alternative IV-B would be similar to Alternative IV-A, but would generally occur over a slightly larger geographic area. Alternative IV-B was rated second for reducing impacts to soil resources. While both Alternatives IV-A and IV-B are expected to result in moderate adverse impacts in the short term due to vegetation treatments, in the long term, Alternative IV would have moderate beneficial impacts to soil resources.

Impacts from Alternative V

Alternative V was rated fourth overall for reducing impacts to soil resources. Alternative V would do less to restore native shrubland communities due to a more passive approach to vegetation treatments. While this would reduce short-term impacts to soils, long-term effects related to restoration of upland vegetation communities and soil function would cover a smaller geographic area compared to Alternatives IV-A, IV-B, and VI. Alternative V also contains greater potential for mineral development coupled with impacts of potential development areas to soil with higher erosion hazard ratings; however, these impacts would be localized. Overall, Alternative V would result in minor beneficial impacts to soil resources in both the short and long term.

Impacts from Alternative VI (Proposed RMP)

Alternative VI was rated third of all the alternatives to reduce impacts to soil resources throughout the planning area. Alternative VI would provide management to reduce soil impacts through upland vegetation treatments to restore native shrubland communities, wildland fire management priorities that protect existing and restored native shrubland communities, and limits on transportation and travel allocations, land use authorizations, and mineral development. Alternative VI would result in moderate adverse impacts in the short term due to vegetation treatments, and moderate beneficial impacts to soil resources in the long term.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Cumulative impacts to soil resources consist of incremental effects of the alternatives when added to other past, present, and reasonably foreseeable future actions. These effects can occur over a long period of time, resulting in the gradual changes in soil erosion potential and ecological function.

Because of similarities in soils and geology, the planning area and the following areas form the geographic boundary for the cumulative impact analysis area for soil resources: adjacent portions of the

Burley, Bruneau, Shoshone, and Wells (NV) Field Offices; the Snake River Birds of Prey National Conservation Area; the South Hills Unit of the Sawtooth National Forest; and the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest. The area includes Federal, State, and private lands. The temporal scope of the analysis is approximately 20 years or the life of the plan.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect soil resources:

- Military Use,
- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Transportation and Travel,
- Land Use Authorizations, and
- Minerals.

These actions are described in the *Introduction* to this chapter.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Past livestock grazing and wildland fires resulted in vegetation removal and, in some areas, replacement with annual or non-native perennial communities. This conversion has been extensive throughout the cumulative analysis area, particularly in areas where the elevation is less than 5,000 feet. Vegetation removal and change to annual or non-native perennial communities has altered the amount and type of soil cover causing increased risk of soil erosion. Livestock grazing, wildland fires, and associated impacts to soils are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Upland vegetation treatments and wildland fire management actions would maintain vegetation at close to current conditions. Under the No Action Alternative, frequency and scale of wildland fire is expected to occur at current or increased levels. High suppression priorities for ignitions on military ranges would shift suppression efforts away from BLM-managed lands within the planning area or adjacent Federal, State, or private lands in the event of multiple incidents. This would result in local or large-scale erosion. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Twenty-five percent of the planning area would remain open to cross-country motorized vehicle use. Users from surrounding areas with more restrictions (e.g., National Forests and the Snake River Birds of Prey National Conservation Area) are expected to utilize the planning area. This is expected to increase existing levels of soil erosion and bulk density and potentially introduce these impacts to previously unused areas.

Past and future land use authorizations have occurred and would occur on adjacent Federal, State, and private lands. Effects to soils from facilities would be local to affected ownerships. However, construction, use, and maintenance of access routes for facilities on adjacent lands would be additive to those described and analyzed for the No Action Alternative. Cumulative effects from land use authorizations would be higher for the No Action Alternative than Alternatives I, III, IV, V, and VI due to fewer restrictions on commercial development.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

Cumulative Impacts from Alternative I

Past livestock grazing and wildland fires resulted in vegetation removal and, in some areas, replacement with annual or non-native perennial communities. This conversion has been extensive throughout the cumulative analysis area, particularly in areas where the elevation is less than 5,000 feet. Vegetation

removal and change to annual or non-native perennial communities has altered the amount and type of soil cover causing increased risk of soil erosion. Livestock grazing, wildland fires, and associated impacts to soils are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Under Alternative I, cumulative impacts related to wildland fire would be due to upland vegetation treatments and wildland fire management actions that would increase vegetation resilience and reduce fire size. This would potentially reduce spread of wildland fire to adjacent Federal, State, and private lands. Reduction of fire size would maintain vegetation cover, therefore decreasing potential for soil erosion by water or wind.

High suppression priorities for ignitions on military ranges would shift suppression efforts away from BLM-managed lands within the planning area or adjacent Federal, State, or private lands in the event of multiple incidents. This would result in local or large-scale erosion. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Alternative I would place travel management restrictions that would add to the acreage of areas closed and limited to designated routes within the cumulative analysis area. Restrictions in the planning area, however, may result in increased soil erosion and bulk density on adjacent Federal and State lands where cross-country motorized vehicle use is less restricted. Increased impacts to adjacent BLM lands would be short-term since the Bruneau, Burley, and Shoshone Field Offices are scheduled to prepare RMPs for their respective planning areas in the near future. The Humboldt-Toiyabe National Forest has finished its travel management planning process and would not see increased impacts from the cross-country travel displaced from the planning area. According to current policy, transportation and travel allocations would substantially decrease the amount of areas open to cross-country motorized vehicle use which would reduce soil erosion potential and bulk density.

Soil erosion potential and bulk density would increase throughout the region due to potential land use authorizations resulting in vegetation removal and construction, use, and maintenance of facilities and roads. Cumulative impacts to the planning area, however, should be less extensive under Alternative I compared to the No Action Alternative and Alternative II, which incorporate fewer restrictions on commercial development. This would shift impacts to adjacent Federal, State, and private lands.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

Cumulative Impacts from Alternative II

Cumulative impacts to soil resources under Alternative II are expected to be similar to the No Action Alternative. Alternative II prioritizes the least acreage of all action alternatives for critical suppression and creates a landscape dominated by non-native perennial communities through vegetation treatments. While these plant communities are relatively resilient in the event of wildland fire, wildland fire management priorities would increase the potential for fire spread to adjacent Federal, State, and private lands. Livestock grazing and associated impacts to soils are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Although no areas would be open to cross-country motorized vehicle use, the impacts to soil resources would be larger in scale due to the expected increase in route density associated with commercial operations. As with Alternative I, the lack of cross-country motorized vehicle opportunities would likely shift current use to adjacent Federal or State lands with fewer restrictions.

Cumulative impacts to soil resources resulting from land use authorizations under Alternative II are expected to be similar to those described for the No Action Alternative.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

Cumulative Impacts from Alternative III

Under Alternative III, cumulative effects of wildland fire management on soil resources are expected to be slightly greater than Alternative I. Upland vegetation treatments and wildland fire management actions would increase vegetation resilience and reduce fire size. Increases in wildland fire suppression infrastructure would reduce potential for spread to adjacent Federal, State, and private lands, but direct impacts to soils from roads and fuel breaks would be greater. Livestock grazing and associated impacts to soils are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Cumulative impacts related to transportation and travel actions and land use authorizations would be similar to Alternative I.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

Cumulative Impacts from Alternative IV

Under Alternative IV, cumulative impacts to soil resources due to wildland fire management are expected to be slightly less than Alternative I due to greater acreage prioritized for critical suppression. Upland vegetation treatments and wildland fire management actions would increase vegetation resilience and reduce fire size. Livestock grazing and associated impacts to soils are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Impacts may increase on adjacent lands as grazing is reduced in the planning area. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Cumulative effects of transportation and travel actions and land use authorizations would be similar to Alternative I.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

Cumulative Impacts from Alternative V

Under Alternative V, potential cumulative impacts to soil resources due to wildland fire management would be lowest of all alternatives. Upland vegetation treatments and wildland fire management actions would increase vegetation resilience and reduce fire size. Critical suppression priorities would reduce potential for spread to adjacent Federal, State, and private lands. Livestock grazing and associated impacts to soils are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Impacts may drastically increase on adjacent lands as grazing is reduced in the planning area. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Alternative V contains the most restrictive travel management allocations of all the alternatives; therefore, lack of cross-country motorized vehicle opportunities would likely shift current use and impacts to adjacent Federal or State lands with fewer restrictions.

Likewise, Alternative V contains the least acreage identified for utility right-of-way corridors and wind energy development projects. This would shift development and impacts from the planning area onto adjacent Federal, State, or private lands.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

Cumulative Impacts from Alternative VI (Proposed RMP)

Under Alternative VI, cumulative impacts related to wildland fire would be due to upland vegetation treatments and wildland fire management actions that would increase vegetation resilience and reduce fire size. These impacts from wildland fire are expected to be slightly less than for Alternative I. This would potentially reduce spread of wildland fire to adjacent Federal, State, and private lands. Reduction of fire size would maintain vegetation cover, therefore decreasing potential for soil erosion by water or wind.

High suppression priorities for the sage-grouse management area would shift suppression efforts away from adjacent Federal, State, or private lands in the event of multiple incidents. This would result in local or large-scale erosion on those lands. Removal of livestock from burned public lands would reduce the short-term potential for increased soil erosion and bulk density on those lands. Even though shifting use elsewhere would result in increased soil erosion or bulk density on other Federal, State, or private lands, this effect would be less than would be expected if burned areas were grazed.

Restrictions on motor vehicle travel in the planning area may result in increased soil erosion and bulk density on adjacent Federal and State lands where cross-country motorized vehicle use is less restricted. Increased impacts to adjacent BLM lands would be short-term since the Bruneau, Burley, and Shoshone Field Offices are scheduled to prepare RMPs for their respective planning areas in the near future. The Humboldt-Toiyabe National Forest has finished its travel management planning process and would not see increased impacts from the cross-country travel displaced from the planning area. According to current policy, transportation and travel allocations would substantially decrease the amount of areas open to cross-country motorized vehicle use which would reduce soil erosion potential and bulk density.

Soil erosion potential and bulk density would increase throughout the region due to potential land use authorizations resulting in vegetation removal and construction, use, and maintenance of facilities and roads. Cumulative impacts to the planning area, however, should be less extensive under Alternative VI compared to the No Action Alternative and Alternatives I, II, and III which incorporate fewer restrictions on commercial development. This would shift impacts to adjacent Federal, State, and private lands.

Cumulative impacts from mineral actions are expected to be low enough to not be measurable on adjacent lands as the planning area has not been an area with high interest in minerals. Due to this low interest, few if any future projects would be displaced due to restrictions.

4.3.4. Water Resources

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to water resources:

- **Water quality in water quality impaired streams** – This includes water quality criteria for sediment, nutrients, and dissolved oxygen. These indicators were selected because they are the criteria Idaho Department of Environmental Quality (DEQ) and Nevada Division of Environmental Protection (NDEP) use to determine if water quality is impaired and to ensure the protection of the beneficial uses of water including cold water fisheries, recreation, and agriculture. These water quality criteria can be inferred by the functional condition of riparian areas and wetlands (proper functioning condition [PFC] ratings) and instream habitat conditions (habitat condition [HC] ratings).

- **Riparian condition in water quality impaired streams** – Riparian condition, as represented by PFC ratings, are based on hydrology, riparian vegetation, and the balance between erosional and depositional forces. Some of the factors upon which PFC ratings are based are also used for determining water quality impairment. Therefore, any actions that improve riparian condition would also improve or maintain water quality and promote the attainment of water quality standards for Idaho and Nevada. However, a rating of PFC is a minimal requirement for attaining State water quality standards and often requires riparian conditions to develop beyond PFC. Because PFC ratings are strongly related to water quality, it was used as an indicator for the water resources analysis.
    - The PFC ratings include: proper functioning condition (PFC), functioning at risk with an upward trend (FAR-UP), functioning at risk with no apparent trend (FAR-NA), functioning at risk with a downward trend (FAR-DN), and non-functioning (NF).
    - Stream reaches rated as FAR-NA and FAR-DN were prioritized as Priority 1 for restoration, streams rated as FAR-UP and NF were prioritized as Priority 2 for restoration, and streams rated at PFC were prioritized as Priority 3 for restoration.
- **Habitat condition in water quality impaired streams** – HC ratings encompass instream conditions which are important for fish such as streambank stability, streambank cover, stream substrate condition (including spawning and fine sediments), water temperature (maximums for juvenile fish rearing), pool volume, pool quality, migration barriers, width-to-depth ratio, habitat complexity, and relative fish abundance. Some of the factors upon which HC ratings are based are also used for determining water quality impairment. Therefore, any actions that improve HC ratings would also improve water quality and promote the attainment of water quality standards for Idaho and Nevada. However, attaining State water quality standards often requires habitat conditions beyond a rating of functioning properly for fish. HC ratings include conservation reaches and restoration reaches (restoration reaches are further rated as high, moderate, or low priority for restoration).

The impacts to water quality are tied to the management actions which vary by alternative. Management actions have the potential to impact water quality if they directly, indirectly, or cumulatively change the quantity or quality of water resources within the planning area. Because BLM does not have management discretion for water quantity, the analysis focused on water quality.

The information used for this analysis is displayed on the following maps: Water Quality Impaired Streams (Map 6); Proper Functioning Condition Ratings (Map 16); Riparian Conservation Areas (Map 22); Habitat Condition Ratings (Map 23; and Appendix D, Maps 1 through 9); and Streams Containing Bull Trout and Redband Trout (Map 24).

State water quality standards for Idaho and Nevada define water quality goals for a water body by designating beneficial uses of the water and by setting criteria necessary to protect the beneficial uses. The designated beneficial uses for the streams within the planning area are identified in Chapter 3, Water Resources. The streams with impaired surface water quality are not fully supporting all of the designated beneficial uses and are referred to in this analysis as “water quality impaired streams”.

Methods and Assumptions

Impacts to water resources from management in the following sections of Chapter 2 were analyzed in detail: *Water Resources*, *Riparian Areas and Wetlands*, *Special Status Species*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations, Minerals*, *Areas of Critical Environmental Concern*, and *Wild and Scenic Rivers*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for water resources. Impacts from management for water resources can be found under *Impacts from Water Resources Actions* in the *Fish, Special Status Fish and Aquatic Invertebrates,* and *Wilderness* sections.

The water resources analysis used the DEQ and NDEP stream layer for water quality impaired streams to identify the stream miles that are not meeting all of their designated beneficial uses. The National Hydrography Dataset is a feature-based database that interconnects and uniquely identifies the perennial, intermittent, and ephemeral stream segments or reaches that make up the nation’s surface

water drainage systems (i.e., watersheds). The National Hydrography Dataset for the Jarbidge planning area is at a scale of 1:24,000/1:12,000 scale which is more detailed than the 1:100,000-scale National Hydrography Dataset layer used by DEQ. The miles of perennial, intermittent, and ephemeral stream used for the analysis were based on the 1:24,000/1:12,000 scale.

The water quality impaired streams were paired with the geographic information system data layers for PFC data to identify their riparian condition and HC data to identify the instream condition. The current PFC and HC ratings are displayed in the Aquatic and Riparian Management Strategy (ARMS; Appendix D). Information on the process used to generate miles of PFC functional condition ratings and the validation with the HC data is included in the *Riparian Areas and Wetlands* and *Special Status Fish and Aquatic Invertebrates* sections.

Riparian reaches that are water quality impaired and PFC rated as Priority 1 (FAR-NA or FAR-DN) and Priority 2 (FAR-UP or NF) were included in the water quality analysis because they are areas where water quality and riparian conditions are impaired and are most likely to be affected by management actions. Areas that are PFC rated as Priority 3 (functioning properly) that are water quality impaired were also included in the analysis because their impairment indicates water quality has not yet achieved State water quality objectives.

Streams that are water quality impaired and identified as HC restoration reaches (restore instream condition) for special status fish management were included in the water quality analysis because they are areas where water quality and instream habitat condition are impaired and are most likely to be affected by management actions. HC conservation reaches (maintain instream condition) that are water quality impaired were also included in the analysis because their impairment indicates water quality has not yet achieved State water quality objectives.

Perennial stream miles were provided to establish a context for the miles of streams that have the potential to be affected by a specific land use allocation and to provide a relationship between the miles of streams available for a use relative to the miles of streams available for the use that have water quality, PFC, and HC data.

The primary goals and objectives in the planning area regarding water resources are:

- Improvement and maintenance of the chemical, physical, and biological integrity of water resources; and
- Improvement and maintenance of Federal and State water quality standards.

The miles in Table 4-52 were used as a baseline for the water resources analysis.

Table 4-52. Baseline Miles for Stream Types Addressed in this Analysis

Indicator	Perennial	Intermittent	Total
Water Quality Impaired Streams	182[A]	245[B]	427
Water Quality Impaired Streams with PFC data	125	0	125
Water Quality Impaired Streams with HC data	31	0	31
Streams in the Planning Area	316	512	828

[A] 172 miles are in Idaho and 10 miles are in Nevada.
[B] All intermittent streams are in Idaho.

Many of the stream reaches that are currently identified as water quality impaired were not identified as water quality impaired in the 1987 Jarbidge RMP because the amendment to the Water Quality Act of 1987, which required states to develop non-point source management plan that included Total Maximum Daily Loads (TMDLs), had not been finalized. The TMDLs identify the water quality indicators that are impaired.

The following assumptions were made when conducting the impact analysis:

- Water quality impaired streams includes both perennial and intermittent streams.

- The water quality impaired designations are based on a broad-scale rating representative of an entire stream reach. Small components of water quality impaired streams may display conditions that are higher or lower than the overall reach rating.
- Streams without condition data (i.e., PFC, HC, or water quality data) would be affected by management actions in a similar manner as streams with condition data.
- The management direction in Chapter 2 for *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, and *Special Status Species* (specifically the *Management for Special Status Species in Riparian Areas, Wetlands, and Streams* section) would maintain or improve water quality in both water quality impaired streams and non-water quality impaired streams in the long term.
- Water quality impaired streams that are rated as PFC or are identified as HC conservation reaches are moving toward achieving state water quality standards and designated beneficial uses. Water quality impaired streams that are rated as PFC and are HC restoration reaches are expected to move toward or achieve state water quality standards under the management direction in Chapter 2 for *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, and *Special Status Species* (specifically the *Management for Special Status Species in Riparian Areas, Wetlands, and Streams* section).
- Water quality impaired streams that are intermittent are expected to move toward or achieve state water quality standards under the management direction in Chapter 2 for *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, and *Special Status Species* (specifically the *Management for Special Status Species in Riparian Areas, Wetlands, and Streams* section).
- None of the resource management actions in Chapter 2 would alter the baseline hydrology within the planning area. Therefore, impacts to water quantity are not expected to be detectable for any of the alternatives.
- Some of the PFC assessed reaches may become intermittent (limited by surface water) during low water years or low flow periods.
- Alternatives that emphasize active management have an increased risk for short-term impacts to water quality. The more management activities applied to a specific location, the greater the risk for short-term impacts to water quality.
- Active restoration techniques would result in faster rates of recovery and improvement of water quality than passive restoration techniques.
- Mitigation, conservation measures, and best management practices (BMPs) would reduce, minimize, or eliminate impacts from surface-disturbing activities. However, as levels of activity increase, the effectiveness of BMPs (Appendix B) at minimizing impacts to water quality would decrease. Alternatives that pose higher levels of surface-disturbing activities pose greater inherent risks to water quality than alternatives that have reduced levels of surface-disturbing activities.
- The DEQ and NDEP would support the BMPs defined in the Idaho Agricultural Pollution Abatement Plan developed with input from the Natural Resources Conservation Service, Idaho Soil Conservation Commission, and Idaho Department of Lands (IDL) (Resource Planning Unlimited Inc., 2003b), as well as grazing BMPs defined by Natural Resources Conservation Service, BLM, Forest Service (USFS), and IDL (Resource Planning Unlimited Inc., 2003a).
- The goals and objectives for water resources and riparian areas and wetlands, as supported by the restoration priorities in the ARMS (Appendix D; Tables D-3, D-4, and D-5), and application of BMPs in watersheds containing water quality impaired streams would ensure that no further water quality degradation occurs that would result in additional streams being identified as water quality impaired. Management direction would improve riparian and instream conditions, as represented by PFC and HC ratings, which would improve water quality in impaired streams over the life of the plan.
- Allocation of an area for resource uses would result in direct, indirect, or cumulative impacts to resources within the allocation area.
- Natural disturbances such as wildland fire, windstorms, floods, and drought impact water quality. These natural events contribute to the diversity and complexity required for healthy aquatic systems. Natural events were not evaluated except where they are directly influenced by management activities such as uncharacteristic wildland fire.
- Noxious weed and invasive plant treatments would be conducted according to existing guidelines such as Endangered Species Act-related biological opinions, conservation agreements, management plans for areas with special designations, and BLM policy regarding specific herbicides and biological controls. These guidelines would be effective in reducing direct and indirect impacts to water quality.

- The BLM has limited authority under the 1872 Mining Law and the Mining and Mineral Policy Act of 1970 to limit or restrict the exploration and development of locatable minerals. Mining in the vicinity of surface water is inherently disruptive, and short- and long-term impacts to water quality, watershed conditions, channel stability, and local hydrology would still occur. All alternatives would use the conservation and restoration priorities in the ARMS (Appendix D; Tables D-3, D-4 and D-5) and BMPs to mitigate the effects of mining on the water resources and would maintain water in the long term.

Direct and Indirect Impacts

Impacts from Water Resources Actions

The following indicators were used to analyze the impacts of Water Resource actions on water resources:

- Water quality in water quality impaired streams,
- Riparian condition in water quality impaired streams, and
- Habitat condition in water quality impaired streams.

Impacts from Management Specific to the No Action Alternative

The objective for water resources is to maintain or improve water quality in accordance with Federal and State standards. This alternative includes general direction to design and construct facilities to minimize adverse impacts to water quality, which would prevent degradation of water quality. The No Action Alternative is expected to maintain proper functioning condition (PFC) and habitat condition (HC) ratings, which would maintain water quality in the current condition.

Impacts from Management Common to All Action Alternatives

All action alternatives include management direction for aquatic resources to maintain or improve special status fish and aquatic invertebrate species habitats and riparian condition using the restoration priorities in the ARMS (Appendix D; Tables D-3, D-4, and D-5). The actions implemented to maintain or improve habitat condition (HC ratings) for special status fish and aquatic invertebrate species and riparian condition (PFC ratings) would also improve water quality. Implementing restoration priorities outlined in the ARMS would result in fewer impacts to water quality in the long term than is expected for the No Action Alternative.

All action alternatives would incorporate best management practices (BMPs) into management activities and authorized and allowed uses to reduce impacts to water quality. Existing authorized and allowed uses that are a factor in not meeting water quality standards would be modified to incorporate BMPs or suspended in order to improve water quality. A variety of watershed improvement projects would be implemented to reduce impacts to water quality including erosion control treatments, upland and riparian vegetation restoration treatments, and road improvements in Riparian Conservation Areas. Short-term localized adverse effects from these activities are expected to be offset by long-term area-wide improvements in water quality.

Impacts from Riparian Areas and Wetlands Actions

Riparian vegetation such as trees, brush, grasses, and forbs play an important role in building and maintaining productive streams. Trees and shrubs provide shade and streambank stability because of their massive root systems and dense canopy. Streamside vegetation needs to be vigorous and dense and to have enough species diversity that it can form layers over the ground. Each vegetative type (i.e., woody and herbaceous) plays an important role in forming and protecting the aquatic habitat (Platts, 1991). Water quality is directly influenced by streamside vegetation. Riparian vegetation reduces instream fine sediments and the intensity of solar radiation, assimilates nutrients, and moderates streamflows. These values are a component of proper functioning condition (PFC), habitat condition (HC), and water quality impaired stream designations.

The following indicator was used to analyze the impacts of Riparian Areas and Wetlands actions on water resources:

- Water quality in water quality impaired streams and
- Riparian condition in water quality impaired streams.

The miles of water quality impaired PFC priority reaches are identified in Table 4-53.

Table 4-53. Water Quality Impaired Perennial Streams and Priority Reaches (Miles)

PFC Priority Rating	Miles of Water Quality Impaired Priority Reaches	Total Miles of Priority Reaches
Priority 1	49	76
Priority 2	42	63
Priority 3	34	85
Total	**125**	**224**

Additional information on the role of riparian vegetation in maintaining riparian condition and fish habitat can be found under *Impacts from Riparian Areas and Wetlands Actions* in the *Riparian Areas and Wetlands* and *Special Status Fish and Aquatic Invertebrates* sections. The objectives for riparian improvement that would determine rate of water quality improvement are included in the *Riparian Areas and Wetlands* section. The location and priorities for riparian restoration are included in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5; Maps D-1 through D-9).

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes direction to maintain or improve riparian habitat condition and identifies fish and riparian values as high priorities. Riparian and wetland habitat would have a high priority for protection and improvement according to BLM Manual 6700. Those management actions within floodplains and wetlands would include measures to preserve, protect, and, if necessary, restore their natural function. The No Action Alternative is expected to maintain riparian condition, and therefore water quality, in the current condition which would not be sufficient to improve water quality impaired streams to a level that meets all applicable Federal and State water quality standards.

Impacts from Management Common to All Action Alternatives

All action alternatives include riparian objectives to maintain or improve riparian condition using the priorities for restoration and recovery based on the PFC and HC ratings (Appendix D, Tables D-3, D-4, and D-5). Riparian management for all alternatives would maintain or improve riparian condition which would also maintain or improve water quality within these stream reaches. The rate of improvement in water quality would vary between alternatives according the amount of authorized uses and activities and the passive or active restoration emphasis. For all action alternatives, priorities for improving riparian condition would include streams that are water quality impaired. The result of riparian management would be an improvement in water quality for all of the 125 miles of water quality impaired PFC rated streams within the planning area. The water quality in the 100 miles of non-water quality impaired PFC rated streams would be maintained. Maintaining or improving PFC ratings on the PFC rated streams is expected to maintain or improve water quality on all of the 182 miles of water quality impaired perennial stream within the planning area. For all action alternatives, active riparian restoration actions would result in short-term, localized adverse impacts to water quality, but water quality in impaired streams would improve throughout the planning area in the long term.

All action alternatives include management actions for improving wetland conditions under the direction for Category 3 and Category 4 Riparian Conservation Areas. This is expected to reduce impacts to wetlands, which would improve water quality in wetlands over the life of the plan. Water quality in wetlands is expected to improve under all action alternatives as a result of implementing this management direction.

Impacts from Management Specific to Alternative I

Riparian management would result in 60 miles of Priority 1 reaches achieving PFC, 17 miles of Priority 1 and 63 miles of Priority 2 reaches moving toward PFC, and 85 miles of Priority 3 reaches being maintained at PFC. Under this management, 145 miles of stream would achieve PFC and 80 miles would

be moving toward PFC over the life of the plan. Alternative I is expected to have more improvement in water quality than the No Action Alternative and Alternative II, but less than Alternatives III, IV, V, and VI.

Impacts from Management Specific to Alternative II

Riparian management would result in 77 miles of Priority 1 reaches and 63 miles of Priority 2 reaches moving toward PFC, and 85 miles of Priority 3 reaches being maintained at PFC. Under this management, 140 miles would be moving toward PFC. It is expected that a portion of the reaches moving toward PFC would actually achieve PFC. Alternative II is expected to have fewer miles of stream achieving PFC than the other action alternatives, but there would be more improvement in water quality than would be expected for the No Action Alternative. The rate of improvement in water quality is expected to be slower for Alternative II than for the other alternatives, except for the No Action Alternative.

Impacts from Management Specific to Alternative III

Riparian management would result in 77 miles of Priority 1 reaches and 21 miles of Priority 2 reaches achieving PFC, 42 miles of Priority 2 reaches moving toward PFC, and 85 miles of Priority 3 reaches being maintained at PFC. Under this management, 183 miles of stream would achieve PFC and 42 miles would be moving toward PFC over the life of the plan. The priority areas for active restoration would be in habitats occupied by special status species which are broadly distributed across the planning area. Alternative III, similar to Alternatives IV, V, and VI, would have more miles of PFC rated streams achieving PFC and is more likely to achieve state water quality standards than the No Action Alternative and Alternatives I and II.

Impacts from Management Specific to Alternative IV and VI (Proposed RMP)

The impacts of riparian management on water quality for Alternative IV and VI are similar to Alternative III because the objectives for riparian improvement are the same for all three alternatives. The priority areas for active riparian restoration would be in habitats occupied by special status species. The increased emphasis for active restoration would result in a greater risk of short-term, localized impacts to water quality, but the amount and rate of improvement in water quality is expected to be faster than for the No Action Alternative and Alternatives I, II, and V.

Impacts from Management Specific to Alternative V

The impacts of riparian management on water quality for Alternative V are similar to Alternatives III, IV, and VI because the objectives for riparian improvement are the same for all four alternatives. However, the priority areas for riparian restoration would be in habitats occupied by special status species, with active restoration being limited to functioning at risk with a downward trend or non-functioning reaches and the amount of authorized uses would be less. The increased emphasis in Alternative V for passive restoration would result in a fewer short-term impacts to water quality, but slower rates of recovery for PFC ratings and water quality as compared to the other alternatives. The passive restoration techniques would result in some riparian reaches having limited improvement where active techniques would be more effective in improving PFC ratings and water quality. Most of the improvement in riparian condition and water quality would occur as a result of the reduced authorized uses under this alternative.

Impacts from Special Status Species Actions

Managing streams to maintain and promote the biological needs of special status fish and aquatic invertebrate species directly influences water quality. Special status fish and aquatic invertebrate species require stable streams that are well vegetated, with low instream fine sediments and cool water temperatures for survival and reproduction (Appendix D, Tables D-1 and D-2). Shaded stream areas are the preferred habitats of juvenile salmonids (Platts, 1991). The quantitative habitat condition (HC) ratings (instream) and the qualitative proper functioning condition (PFC) ratings (riparian area) include components that are used for identifying a stream as water quality impaired. PFC is a minimal requirement for special status fish and aquatic invertebrate species habitat, and the attainment of State water quality standards often require development beyond an initial rating of PFC. The HC rating process goes beyond PFC by evaluating sediment, water temperature, fish abundance, and instream

characteristics related to hydrological function (e.g., depth, maximum width, length, area, number/mile, and dominant substrate of pools).

The following indicator was used to analyze the impacts of Special Status Species actions on water resources:

- Water quality in water quality impaired streams, and
- Habitat condition in water quality impaired streams.

The miles of water quality impaired perennial streams with HC data and their associated HC ratings are displayed in Table 4-54. Thirty-one miles of the 182 miles of water quality impaired streams (17%) have HC data for special status fish and aquatic invertebrate species, 21 miles are identified for restoration, and 10 miles are currently meeting objectives for special status fish habitat.

Table 4-54. Water Quality Impaired Conservation and Restoration Reaches (Miles)

HC Rating	Miles of Water Quality Impaired Streams with HC Data	Total Miles of Streams with HC Data
Conservation	10	18
Restoration	21	35
Total	**31**	**53**

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes management direction to protect the aquatic habitat of Candidate species for Endangered Species Act (ESA) listing and BLM Sensitive species in a portion of the Snake River below lower Salmon Falls Dam, which would provide general direction for maintaining water quality. The 500-foot year round occupancy restrictions for oil and gas exploration and development would avoid impacts to water quality in streams containing special status fish and aquatic invertebrate species.

The result of the special status species management for the No Action Alternative is indicated by the current HC data, which were collected for streams containing special status fish species such as Interior Columbia River redband trout and Jarbidge River bull trout. The management for special status species in the No Action Alternative is expected to maintain or slightly improve water quality in water quality impaired HC restoration and conservation reaches.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The No Action Alternative and all action alternatives include direction to follow current conservation measures in biological opinions and letters of concurrence as developed in consultation with the US Fish and Wildlife Service (Appendix D, Table D-10 and Appendix E, Table E-3, E-4, and E-5). This direction would maintain or improve HC ratings for aquatic species for which ESA consultation has been completed and would maintain or improve water quality in these occupied habitats. Compliance with the Clean Water Act would maintain or improve water quality in streams that are not encompassed in watersheds affected by ESA consultation.

Impacts from Management Common to All Action Alternatives

All action alternatives include management direction to maintain or improve special status fish and aquatic invertebrate species habitats using the conservation and restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5). Implementing these priorities would improve habitat condition and water quality. All action alternatives would result in 21 miles of water quality impaired HC restoration reaches having improved water quality due to implementing restoration actions for special status fish and aquatic invertebrate species habitat. The 10 miles of water quality impaired HC conservation reaches would be maintained in the current condition, although additional assessment may be required to determine the reason for the impaired water quality.

Impacts from Wildland Fire Ecology and Management Actions

Wildland fire can reduce water quality in the short term, but can improve water quality in the long term by regenerating riparian vegetation and contributing woody materials and other debris to the stream channel, increasing instream habitat complexity and streamside shading. The length of time for water quality to recover from the effects of wildland fire is directly related to the rate of riparian recovery and the level of land uses in the impacted area. Watersheds that burn more frequently than they did historically are more likely to have long-term reductions in water quality because riparian recovery does not achieve hydrological functions that would improve to levels that support State water quality standards. Low severity wildland fire can stimulate riparian vegetation, making it more vigorous over time, which would improve water quality as long as wildland fires occur over longer intervals.

The following indicator was used to analyze the impacts of Wildland Fire Ecology and Management actions on water resources:

- Water quality in water quality impaired streams (in proper functioning condition [PFC] Priority 1 and 2 reaches).

Streams that are water quality impaired and PFC Priority 1 and 2 reaches and habitat condition (HC) restoration reaches are at an increased risk for impacts to water quality from wildland fire or wildland fire suppression due to their reduced condition. Streams that are water quality impaired and rated as PFC and are HC conservation reaches are at a lower risk for impacts to water quality from wildland fire or wildland fire suppression than the restoration reaches. Critical suppression areas represent the highest suppression priority for reducing fire size and acres burned. Alternatives that include water quality impaired Priority 1 and 2 reaches and water quality impaired restoration reaches in critical suppression areas would reduce the potential for impacts to water quality in these streams. Conditional suppression areas, which represent areas of lower suppression priority based on the resource values or a desired fire role in the ecosystem, could result in unsuppressed wildland fire in a Riparian Conservation Area (RCA). This would pose a greater risk for short- and long-term effects to riparian condition and water quality than would be expected in the critical suppression areas.

The water quality impaired streams and water quality impaired priority reaches by Vegetation Management Area (VMA) are displayed in Table 4-55. VMA D has the most miles of water quality impaired Priority 1 and 2 reaches of the four VMAs, while VMA A has the fewest. The wildland fire suppression priorities vary in each action alternative relative to the VMAs, and are discussed within each action alternative section below.

Table 4-55. Water Quality Impaired Streams and Priority Reaches by Vegetation Management Area

VMA	Miles of Water Quality Impaired Streams	Miles of Water Quality Impaired Priority Reaches	
		Priority 1 and 2	Priority 3
A	71	4	9
B	137	36	1
C	60	13	6
D	159	37	18
Total	**427**	**90**	**34**

The miles of perennial water quality impaired priority reaches in critical and conditional suppression areas are displayed in Table 4-56. The miles of perennial stream by VMA and the miles of HC conservation and restoration reaches included in critical and conditional suppression areas are provided in the *Special Status Fish and Aquatic Invertebrates* section.

Table 4-56. Water Quality Impaired Perennial Streams by Priority Reaches in Critical and Conditional Suppression Areas by Alternative (Miles)

PFC Priority Rating	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Critical Suppression Area							
Priority 1 and 2	40	18	32	59	46	91	31
Priority 3	19	15	17	28	22	34	19
Total	**59**	**33**	**49**	**87**	**68**	**125**	**50**
Conditional Suppression Area							
Priority 1 and 2	51	72	58	31	44	0	60
Priority 3	15	19	17	6	12	0	16
Total	**66**	**91**	**75**	**37**	**56**	**0**	**76**

[A] The No Action Alternative does not identify critical or conditional suppression areas.

Wildland fire suppression efforts can increase erosion rates when fire lines are constructed on steep slopes, erosive soils, or in RCAs. The removal of vegetation can also increase the speed with which overland flow reaches the channel network and the amount of surface water added to the channel. In the most severe cases, the combination of these effects can increase peak flows in burned watersheds and result in channel erosion. Surface-disturbing activities associated with wildland fire suppression, as well as loss of surface vegetation due to wildland fire, can result in a decrease in ground cover, which can increase sediment delivery to streams and reduce of water quality.

Fuels treatments in the riparian area would have short-term impacts but potentially long-term improvements in riparian vegetation in Priority 3 reaches. Priority 1 and 2 reaches may not respond in a similar manner because they tend to burn with greater severity and take more time to recover.

Prescribed fire can be used to manage fuel loads and reduce wildland fire severity. By burning vegetation and organic matter on the soil surface, wildland fires can increase erosion rates and affect water quality. The effects of prescribed fire are less severe than wildland fire because the location and severity of the fire are controlled; therefore the potential for erosion can be reduced. Prescribed fires allow for sediment-trapping buffers to be left around stream channels to reduce sediment delivered to the stream and risk to water quality. Also, prescribed fires are not typically used to burn an entire watershed, which minimizes the potential for changes in water yield and peak flow. Furthermore, the use of prescribed fire reduces the risk of uncontrolled, high-severity wildland fires that would burn through riparian areas and impact water quality.

A variety of mechanical, chemical, and manual methods would be used to restore vegetation and stabilize soils within burned areas. Some localized short-term adverse effects to water quality would occur, but these treatments are expected to reduce surface erosion in these areas.

Impacts from Management Specific to the No Action Alternative

This alternative identifies full suppression of all new wildland fires and does not prioritize wildland fire suppression resources based on resource values at risk during multiple ignitions. The result would be increased risk for wildland fire impacts to high priority RCAs and water quality during multiple ignitions. Large wildland fires are expected to continue due to factors that are beyond human control (i.e., drought conditions, weather, and availability of flashy fuels). Within the Bruneau-Jarbidge Rivers Wilderness and Wild and Scenic River (WSR) designations, wildland fire suppression tactics would not impair Wilderness or WSR values, which would also reduce impacts to water quality within these areas. Outside of these special designations, the No Action Alternative provides general management direction for wildland fire suppression, fuels treatments, and emergency stabilization and burned area rehabilitation relative to protecting watershed and riparian conditions to maintain water quality or improve water quality in impaired streams. This management direction is expected to reduce wildland fire suppression-related impacts to PFC and HC ratings which would reduce impacts to water quality impaired streams and promote the attainment of Idaho and Nevada water quality standards.

Impacts from Management Common to All Action Alternatives

All action alternatives identify critical and conditional wildland fire suppression areas to prioritize the distribution of suppression resources based on the resource values at risk during multiple ignitions. The result of this prioritization is that areas with greater resource values, such as RCAs, would be less likely to be impacted by wildland fire during multiple ignitions than areas with fewer resource values at risk. All action alternatives also include minimum impact suppression tactics (MIST) for wildland fire suppression in riparian areas. Site-specific mitigation, such as drafting water from streams in a manner that does not cause localized dewatering and avoiding fueling, staging, and other fire support activities in RCAs, would minimize the potential effects from wildland fire suppression activities to impact water quality. For all action alternatives, the management direction for wildland fire suppression would reduce impacts to PFC and HC ratings, which would reduce impacts to water quality and promote the attainment of Idaho and Nevada water quality standards.

Impacts from Management Specific to Alternative I

For this alternative, VMA C has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. VMAs B and C contain 197 miles of water quality impaired streams. For these streams, there is 125 miles of PFC rated reaches which include 59 miles of water quality impaired stream in critical suppression areas and 66 miles in conditional suppression areas. There are 51 miles water quality impaired Priority 1 and 2 reaches in conditional suppression areas which are at the most risk for a reduction in water quality from wildland fire. Alternative I would have the fourth most miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas; more than Alternatives IV and V but less than Alternatives II, III, and VI. Alternative I is expected to result in fewer impacts to water quality than Alternatives II, III, and VI but more than Alternatives IV and V with regard to wildland fire management.

Table 4-57. Perennial Streams Impacted by Critical and Conditional Suppression Areas in Alternative I (Miles)

Stream Type	Critical Suppression Areas	Conditional Suppression Areas
Perennial Streams	214	102
Water Quality Impaired Streams	59	66
Water Quality Impaired Priority 1 and 2 Reaches	40	51
Water Quality Impaired Priority 3 Reaches	19	15

There would be an increase in the use of local water sources and creation of new water developments for wildland fire suppression under Alternative I. The types of water development would include water storage tanks, draft sites, hydrants off pipelines, and enlarging stock water and surface water storage ponds. The general effects of diverting surface flows from streams would depend upon the amount of water used and the rate and time of year surface waters are diverted. Depending upon location, the use or expansion of stock water and other water storage ponds could have localized but short-term impacts to water quality. Water storage impoundments can affect streams by altering streamflows or introducing sediments into stream channels, which can locally impact water quality. The use of flowing waters for wildland fire suppression would have localized effects to riparian areas and wetlands but is not expected to measurably reduce PFC or HC ratings. Increases in water temperature due to reduced flows from wildland fire suppression are not expected to be measurable compared to impacts to water temperature due to the wildland fire. Any impacts related to suppression would be localized and short-term and would subside as flows return to their pre-suppression condition. The development of new surface water drafting sites could have localized effects to streamflow if water is diverted during low flow conditions or at a rate that locally reduces surface flows. Water quality can also be affected where petroleum products are used to operate water pumps in RCAs. However, the management direction for wildland fire suppression, such as MIST, would minimize the potential for impacts to water quality.

Alternative I would include improvements to existing roads in RCAs to reduce response time for wildland fire suppression. Improving road surfacing, realigning roads away from riparian areas and wetlands,

improving road drainage, or replacing damaged riparian vegetation would have short-term impacts to water quality, but would reduce sediment contributions to streams and maintain or improve water quality in the long term. Improving response time for wildland fire suppression would result in fewer large-scale and long-term impacts to water quality as a result of fewer acres being burned by wildland fire.

This alternative would allow new roads to be constructed to enhance wildland fire suppression. New roads in upland areas would likely have a minor, if any, effect on riparian areas as long as best management practices (BMPs) are used to minimize off-site surface erosion into RCAs. Segments of new roads in RCAs would have localized effects to PFC and HC ratings and water quality. The effects of building new roads in RCAs would result in additional surface disturbance that would locally reduce riparian vegetation and introduce sediment into riparian areas. These new roads would have the same effect to streams as existing roads, but would add to the amount of sediment introduced. Roads constructed in RCAs would use the conservation and restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5), BMPs (Appendix B), and Conservation Measures (Appendix E) to reduce impacts to water quality. Short-term effects to PFC ratings and water quality from wildland fire suppression-related road improvements would occur, but would be reduced in the short and long term by applying the management in the identified appendices.

The new roads in upland areas would improve the response time for wildland fire suppression and reduce the potential for RCAs to burn due to a large wildland fire, especially in VMAs B and D, which contain a large percentage of water quality impaired Priority 1 and 2 reaches. New roads in uplands within these VMAs are expected to result in fewer miles of Priority 1 and 2 reaches burned by wildland fire and fewer impacts to water quality in the long term.

Management to improve stream crossings by upgrading undersized culverts or replacing culverts with bridges would result in localized short-term adverse impacts but long-term benefits to water quality. Designing road crossings to allow for water withdrawals for wildland fire suppression would eliminate additive impacts to streams from creating new water drafting sites in undisturbed areas.

The impacts of targeted grazing to treat fuels are described in detail in the *Riparian Areas and Wetlands* section under *Impacts from Noxious Weeds and Invasive Plants Actions*. Targeted grazing would be expected to increase impacts to RCAs, particularly in VMAs B and D, which contain the majority of water quality impaired Priority 1 and 2 reaches (73 miles). These potential impacts to PFC and HC ratings would be avoided if additional infrastructure is used to reduce livestock access to RCAs.

Impacts from Management Specific to Alternative II

For this alternative, VMA A has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. VMAs A and B contain 208 miles of water quality impaired streams. For these streams, there are 125 miles of PFC rated reaches which include 33 miles of water quality impaired streams in critical suppression areas and 91 miles of water quality impaired streams in conditional suppression areas. There are 72 miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas which are at the most risk for a reduction in water quality from wildland fire. Alternative II would have the most miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas of all alternatives. Therefore, management specific to Alternative II is expected to result in the most adverse impacts to water quality with regard to wildland fire management during multiple ignitions.

Table 4-58. Perennial Streams Impacted by Critical and Conditional Suppression Areas in Alternative II (Miles)

Stream Type	Critical Suppression Areas	Conditional Suppression Areas
Perennial Streams	87	229
Water Quality Impaired Streams	33	91
Water Quality Impaired Priority 1 and 2 Reaches	18	72
Water Quality Impaired Priority 3 Reaches	15	19

Creating new and improving existing water developments, improving roads and stream crossings, and building new roads in areas with limited access would have the same effects to water quality as described for Alternative I.

Prescribed fire, targeted grazing, and increased permitted livestock use would be used to reduce fuels. The effects from using targeted grazing for fuels treatments are similar to those described under *Impacts from Noxious Weeds and Invasive Plants Actions* in the *Riparian Areas and Wetlands* section. Prescribed fire has similar, but less pronounced, effects on the landscape as wildland fire because prescribed fires are planned ignitions and conducted according to specific project objectives (e.g., fire intensity, acreages, and weather conditions). The use of prescribed fire in riparian areas would locally reduce PFC and HC ratings and water quality because the fire would remove desirable riparian vegetation as well as the targeted noxious weeds and invasive plants. The adverse effects to herbaceous riparian species would be expected to be short-term as these species would recover quickly and may result in long-term beneficial impacts as the prescribed burn may stimulate growth of these plants. The effects to woody riparian vegetation would be expected to be long-term (5 to 10 years) because woody riparian vegetation recovers more slowly than herbaceous riparian vegetation (Burton, 2005; Rieman and Clayton, 1997). Once the woody riparian vegetation has recovered, PFC and HC ratings and water quality may be improved compared to their pre-burn condition.

Impacts from Management Specific to Alternative III

For this alternative, VMA B has the highest priority for wildland fire suppression during multiple ignitions, while VMA A has the second highest priority. VMAs A and B contain 208 miles of water quality impaired streams. For these streams, there are 125 miles of PFC rated reaches which include 49 miles of water quality impaired streams in critical suppression areas and 75 miles of water quality impaired streams in conditional suppression areas. There are 58 miles of water quality impaired Priority 1 and 2 reaches within conditional suppression areas, which are at the most risk for a reduction in water quality from wildland fire. Alternative III would have the third most miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas; more than Alternatives I, IV, and V but less than Alternatives II and VI.

Table 4-59. Perennial Streams Impacted by Critical and Conditional Suppression Areas in Alternative III (Miles)

Stream Type	Critical Suppression Areas	Conditional Suppression Areas
Perennial Streams	168	148
Water Quality Impaired Streams	49	75
Water Quality Impaired Priority 1 and 2 Reaches	32	58
Water Quality Impaired Priority 3 Reaches	17	17

There would be more wildland fire suppression-related infrastructure to increase water availability for wildland fire suppression under this alternative than any of the other action alternatives. The effects from water storage tanks, draft sites, hydrants off pipelines, and enlarging stock water and surface water storage ponds would be similar to Alternative I, except more of these improvements would occur in Alternative III. New pipelines could have localized but short-term impacts to streamflows as additional water is removed from streams. Alternative III would have the most risk for reducing PFC and HC rating and water quality due to increased wildland fire suppression infrastructure as compared to the other alternatives. The effects of improving existing roads and stream crossings and building new roads are similar to, but more than, those described for Alternative I.

Fuels treatments would include increased permitted livestock grazing, targeted grazing, and prescribed fire. These fuels treatments would have similar effects to PFC and HC ratings, and water quality as described for targeted grazing in under *Impacts from Noxious Weeds and Invasive Plants Actions* in the *Riparian Areas and Wetlands* section and for prescribed fire in Alternative II. Fuels treatments in Alternative III, similar to Alternative VI, would occur on more acres than in Alternatives I, II, IV, and V.

Impacts from Management Specific to Alternative IV

For this alternative, VMA C has the highest priority for wildland fire suppression during multiple ignitions while VMA D has the second highest priority. VMAs C and D contain 219 miles of water quality impaired streams. For these streams, there are 125 miles of PFC rated reaches; For Alternative IV-A, there would be 87 miles of water quality impaired streams in critical suppression areas and 37 miles of water quality impaired streams in conditional suppression areas. Alternative IV-B, there would be 68 miles of water quality impaired streams in critical suppression areas and 56 miles of water quality impaired streams in conditional suppression area. There are 31 miles of Priority 1 and 2 reaches in conditional suppression areas for Alternative IV-A and 44 miles of Priority 1 and 2 reaches in conditional suppression areas for Alternative IV-B; these miles are at the most risk for a reduction in water quality due to wildland fire.

Alternative IV-A would have the second fewest miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas, and therefore would have the second least risk for impacts to water quality due to wildland fire management; more than Alternative V but less than the other alternatives. It is the second most likely to maintain PFC and HC ratings and facilitate achieving or moving towards state water quality objectives with regard to wildland fire ecology and management.

Alternative IV-B would have the third fewest miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas, and therefore would have the third least risk for impacts to water quality due to wildland fire management; more than Alternative IV-A and V but less than the other alternatives. It is the third most likely to maintain PFC and HC ratings and facilitate achieving or moving towards state water quality objectives with regard to wildland fire ecology and management.

Table 4-60. Perennial Streams Impacted by Critical and Conditional Suppression Areas in Alternative IV (Miles)

Stream Type	Critical Suppression Areas		Conditional Suppression Areas	
	IV-A	IV-B	IV-A	IV-B
Perennial Streams	251	224	65	92
Water Quality Impaired Streams	87	68	37	56
Water Quality Impaired Priority 1 and 2 Reaches	59	46	31	44
Water Quality Impaired Priority 3 Reaches	28	22	6	12

There would be an increased emphasis on improving water sources, roads and stream crossings, and other infrastructure to enhance wildland fire suppression. However, water development improvements would consist only of hydrants off pipelines and enlarging stock water and surface water storage ponds. The effects from these facilities are the same as those described for Alternative I. The effects of improving existing roads and stream crossings, constructing new roads and crossings would be the same as described for Alternative I.

More acres of fuels treatments would occur in Alternative IV than any of the other alternatives. Not all of these acres would be in RCAs, but riparian areas and special status fish and aquatic invertebrate species habitats would be emphasis areas for fuels treatments. Due to the emphasis of treatments in RCAs, this alternative would have a greater likelihood for prescribed fire to reduce the PFC and HC ratings and water quality in the short term, but would improve water quality in the long term once riparian vegetation has recovered. Targeted grazing in RCAs would have the same effects to riparian areas as described for Alternative I, except there would be more acres of targeted grazing in Alternative IV and therefore a greater likelihood for impacts to PFC and HC ratings, and water quality.

Impacts from Management Specific to Alternative V

In Alternative V, similar to Alternative I, VMA C has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. VMAs C and B contain 197 miles of water quality impaired streams. For these streams, there are 125 miles of PFC rated reaches, all of which are in

critical suppression areas. This alternative would have the most miles of water quality impaired Priority 1 and 2 reaches in critical suppression areas of all alternatives, which would pose the least risk for water quality to be reduced due to wildland fire management. Alternative V is expected to result in fewer impacts to water quality than any of the other alternatives with regard to wildland fire management.

Table 4-61. Perennial Streams Impacted by Critical and Conditional Suppression Areas in Alternative V (Miles)

Stream Type	Critical Suppression Areas	Conditional Suppression Areas
Perennial Streams	303	13
Water Quality Impaired Streams	125	0
Water Quality Impaired Priority 1 and 2 Reaches	91	0
Water Quality Impaired Priority 3 Reaches	34	0

Critical suppression areas in the Sagebrush Sea Area of Critical Environmental Concern (ACEC) would include 259 miles of the 316 perennial streams miles in the planning area. RCAs could be affected from suppression activities in localized areas when there is an urgent need to protect structures and public safety. The Sagebrush Sea ACEC management would not allow for new road construction for wildland fire suppression and vehicle access would be limited in some watersheds containing water quality impaired Priority 1 and 2 reaches. The limited access could lengthen response time for wildland fire suppression, which would result in more acres of Priority 1 and 2 reaches, restoration reaches, and water quality impaired streams being burned by wildland fire. The effects would be similar to those described in Alternative II, resulting in a short-term reduction in water quality due to wildland fire but could result in localized improvements in PFC and HC ratings and water quality in the long term where riparian vegetation is stimulated by the wildland fire.

This alternative would have less wildland fire suppression infrastructure and less watershed disturbance than any of the other action alternatives and would have the least potential to reduce water quality of any alternative due to these activities. Water developments would be maintained at their current levels, resulting in fewer disturbances to PFC and HC ratings, and water quality impaired streams than the other alternatives. However, maintaining water availability and access for wildland fire suppression at current levels would affect suppression response time and result in more acres burned by wildland fire and potentially under more severe wildland fire conditions. Impacts to water quality from wildland fire suppression-related infrastructure would be less but the impacts to water quality overall from wildland fire could be greater under this alternative due to the lack of improvements for wildland fire suppression.

The effects of using prescribed fire for fuels treatments would be similar to those described for Alternative II.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would have the same priority for wildland fire suppression during multiple ignitions and the same miles of water quality impaired streams within the priority areas as Alternative I. There would be 126 miles of PFC rated reaches which include 50 miles of water quality impaired streams in critical suppression areas and 76 miles of water quality impaired streams in conditional suppression areas. There are 60 miles of Priority 1 and 2 reaches in conditional suppression areas which are at the most risk for a reduction in water quality from wildland fire. Alternative VI would have fewer miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas than Alternative II but more than the other alternatives. Alternative VI would have the second most risk for impacts to water quality with regard to wildland fire management; less than Alternative II but more than the other alternatives.

Table 4-62. Perennial Streams Impacted by Critical and Conditional Suppression Areas in Alternative VI (Proposed RMP) (Miles)

Stream Type	Critical Suppression Areas	Conditional Suppression Areas
Perennial Streams	199	117
Water Quality Impaired Streams	50	76
Water Quality Impaired Priority 1 and 2 Reaches	31	60
Water Quality Impaired Priority 3 Reaches	19	16

There would be an increase in the use of local water sources and creation of new water developments for wildland fire suppression (i.e., pipelines, water storage tanks, draft sites, hydrants) and other measures to reduce response time for wildland fire suppression (i.e., new and improved roads, stream crossings) under this alternative. The impacts from these activities on water quality would be similar to those described for Alternative I but would occur at a level most similar to Alternative III. The impacts to water quality from Alternative VI would be similar to but slightly more than Alternative III, which is more than for the other alternatives.

Impacts from Livestock Grazing Actions

Livestock grazing can directly impact water infiltration into the soil due to trampling, soil compaction, and loss of vegetation cover in both upland and riparian areas. This can accelerate surface erosion and increase the amount of fine sediment and nutrients introduced to streams. Accelerated erosion results in an increase in erosion of surface fecal wastes, which can increase bacterial concentrations in streams through direct introductions to water or riparian areas. Water quality can be indirectly impacted by the increases soil runoff, erosion, and sediment delivery to adjacent riparian areas and streams. Impacts to water quality from livestock grazing are often greater in riparian areas due to livestock attraction to shade, water, and palatable vegetation. Grazing can result in increased fine sediment loads from streambank erosion, reduce riparian habitat condition due to stream channel widening and lowering of water tables through down cutting of the stream channel.

Grazing in riparian areas directly affects vegetation condition and instream habitat quality, which can also affect water quality in streams. The effects of livestock grazing on riparian areas are also discussed under *Impacts from Livestock Grazing Actions* in the *Special Status Fish and Aquatic Invertebrates* and *Riparian Areas and Wetlands* sections. Monitoring and adaptive management can be used as a tool to reduce the impacts of livestock grazing on riparian areas and water quality (Williams et al., 2009).

Long-term grazing can change the vegetation composition of some riparian sites. Loss of willows and deep-rooted vegetation makes streambanks more susceptible to water erosion. Also, grazing by livestock and wild ungulates reduces streambank stability through vegetation removal and streambank trampling, increases soil compaction, increases sediment inputs to streams, which causes stream widening or down cutting. Stream widening and sedimentation can increase water temperatures and reduce water quality; these impacts can be compounded by repeated yearly use of the same areas. Fencing streams to exclude livestock grazing is a widely used approach for restoring stream habitats (Platts, 1991). The improved riparian condition within fenced areas would also result in improved water quality. The rate of improvement in water quality impaired streams would depend upon the rate of improvement of proper functioning condition (PFC) and habitat condition (HC) ratings. The riparian vegetation component (PFC rating) is expected to improve more quickly than the instream hydrological components (HC rating). PFC and HC values would need to be functioning properly in order for water quality in to achieve State water quality standards and attain designated beneficial uses (Appendix D, Figure D-1).

The following indicator was used to analyze the impacts of Livestock Grazing actions on water resources:

- Water quality in water quality impaired streams in areas available to livestock grazing (in PFC Priority 1 and 2 reaches).

The miles of water quality impaired streams in areas available and unavailable for livestock grazing are displayed by alternative in Table 4-63. The areas with the greatest potential for impacts to water quality are water quality impaired Priority 1 and 2 reaches (Table 4-64) and the HC restoration reaches that are accessible to livestock grazing.

Table 4-63. Water Quality Impaired Streams in Areas Available and Unavailable for Livestock Grazing by Alternative (Miles)

Livestock Grazing	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Available	315	287	303	302	288	289	199	292
Unavailable	111	139	123	124	138	137	227	134

Table 4-64. Water Quality Impaired Perennial Priority Reaches in Areas Available and Unavailable for Livestock Grazing by Alternative (Miles)

PFC Priority Rating	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Available for Livestock Grazing								
Priority 1 and 2	71	48	59	59	47	48	29	49
Priority 3	28	24	27	27	26	26	12	26
Total	**99**	**72**	**86**	**86**	**73**	**74**	**41**	**75**
Unavailable for Livestock Grazing								
Priority 1 and 2	20	43	31	31	44	43	62	41
Priority 3	7	10	7	7	9	9	22	8
Total	**27**	**53**	**38**	**38**	**53**	**52**	**84**	**49**

Miles of perennial streams and HC conservation and restoration reaches in areas available and unavailable for grazing and in riparian reference areas are displayed in the *Special Status Fish and Aquatic Invertebrates* section.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would allocate between 160,000 and 260,000 animal unit months (AUMs) for livestock at full implementation. There are 125 miles of perennial streams in areas available and 192 miles of perennial streams in areas unavailable to livestock grazing. The 315 miles of water quality impaired streams in areas available for livestock grazing include 71 miles of water quality impaired Priority 1 and 2 reaches; the 111 miles of water quality impaired streams in areas unavailable for livestock grazing include 20 miles of water quality impaired Priority 1 and 2 reaches. Perennial and intermittent stream reaches with impaired water quality that are accessible to livestock grazing would continue to be at risk for impacts to water quality under this alternative if the impairment is due to livestock grazing. This alternative has the most miles of water quality impaired streams and water quality impaired Priority 1 and 2 reaches available for grazing of all the alternatives and therefore poses the greatest risk for impacts to water quality.

Five riparian exclosures, which encompassed approximately 10 miles of stream, were created to exclude livestock under the No Action Alternative. Riparian conditions, instream conditions, and water quality are expected to continue to improve within these exclosures over the long term.

Impacts from Management Common to All Action Alternatives

All action alternatives would allow livestock grazing in accordance with grazing use indicators. Grazing use indicators would include utilization on vegetation in riparian areas and streambank alteration, which are components of the PFC and HC ratings. Adaptive management would be used to monitor grazing use indicators to meet resource and special designation objectives and follow Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. For all action alternatives, riparian condition

and water quality would be expected to be maintained or improved in areas unavailable to livestock grazing, unless there are factors other than grazing causing the impaired water quality.

Impacts from Management Specific to Alternative I

This alternative would authorize between 179,000 and 245,000 AUMs for livestock grazing at full implementation. In Alternative I, 94 miles of perennial streams would be available and 224 miles would be unavailable for livestock grazing. The 287 miles of water quality impaired streams in areas available for livestock grazing include 48 miles of water quality impaired Priority 1 and 2 reaches, while the 139 miles of water quality impaired streams in areas unavailable for livestock grazing include 43 miles of water quality impaired Priority 1 and 2 reaches. Areas unavailable for grazing also include ten riparian reference areas (up to 3,000 acres). Water quality in stream reaches available to livestock grazing would be at risk of impacts from livestock; however, all grazed reaches would be managed to improve riparian conditions, consistent with the goals, objectives and management actions for riparian areas, which would maintain or improve water quality. Alternative I would have the same miles of water quality impaired Priority 1 and 2 reaches in areas available to livestock grazing as Alternative IV-B; more than Alternatives IV-A and V but less than the other alternatives.

Temporary non-renewable (TNR) permits would be allowed if consistent with goals and objectives for riparian areas and wetlands and water quality. The goals and objectives for riparian areas and wetlands would maintain or improve PFC and HC ratings and facilitate moving towards or achieving State water quality standards. Livestock have an increased tendency to eat woody vegetation late in the grazing season after the herbaceous vegetation has cured. Issuing TNR permits late in the grazing season would pose an increased risk to water quality impaired streams where reduced condition is related to livestock grazing.

Impacts from Management Specific to Alternative II

This alternative would authorize between 362,000 and 440,000 AUMs for livestock grazing at full implementation, which is the most of all alternatives. In Alternative II, 111 miles of perennial streams would be available and 206 miles would be unavailable for livestock grazing. The 303 miles of water quality impaired streams in areas available for livestock grazing include 59 miles of water quality impaired Priority 1 and 2 reaches, while the 123 miles of water quality impaired streams in areas unavailable for livestock grazing include 27 miles of water quality impaired Priority 1 and 2 reaches. Areas unavailable for grazing also include ten riparian reference areas (up to 1,000 acres). Those reaches available to livestock grazing would be at risk of impacts from livestock; however, all grazed reaches would be managed to improve riparian conditions by implementing restrictions to seasons of use, utilization, and rotational systems that would ensure grazing would be consistent with the goals, objectives and management actions for riparian areas and maintain or improve water quality. Alternative II would have fewer miles of water quality Priority 1 and 2 reaches available to livestock than the No Action Alternative; it would have the same miles as Alternative III, which is more than for the other alternatives. Alternative II, similar to Alternative III, would pose the second greatest risk for impacts to water quality impaired streams due to livestock grazing.

In areas where reserve common allotments are created, the management plan would be consistent with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management and the goals and objectives for riparian areas and wetlands for riparian areas and water quality. This is expected to maintain or improve PFC and HC ratings which would maintain or improve water quality at levels which would be expected to achieve state water quality standards.

The effects of issuing TNR permits are the same as described for Alternative I.

Impacts from Management Specific to Alternative III

This alternative would authorize between 276,000 and 348,000 AUMs for livestock grazing at full implementation. The miles of water quality impaired streams and water quality impaired Priority 1 and 2 reaches in for areas available and unavailable to livestock grazing and riparian reference areas are the same as described for Alternative II. There would be slightly fewer impacts from livestock grazing compared to Alternative II due to a lower percent of vegetation production allocated to livestock.

Otherwise, the impacts to water quality impaired streams from areas available to livestock grazing would be similar to Alternative II.

The effects of creating reserve common allotments are the same as described for Alternative II. The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Management Specific to Alternative IV

Alternative IV-A would authorize between 78,000 and 123,000 AUMs for livestock grazing at full implementation. In Alternative IV-A, 96 miles of perennial streams would be available and 221 miles would be unavailable for livestock grazing. The 288 miles of water quality impaired streams in areas available for livestock grazing include 47 miles of water quality impaired Priority 1 and 2 reaches, while the 138 miles of water quality impaired streams in areas unavailable for livestock grazing include 44 miles of water quality impaired Priority 1 and 2 reaches.

Alternative IV-B would authorize between 81,000 and 127,000 AUMs for livestock grazing at full implementation. In Alternative IV-B, 97 miles of perennial streams would be available and 220 miles would be unavailable for livestock grazing. The 289 miles of water quality impaired streams in areas available for livestock grazing include 48 miles of water quality impaired Priority 1 and 2 reaches, while the 137 miles of water quality impaired streams in areas unavailable for livestock grazing include 43 miles of water quality impaired Priority 1 and 2 reaches.

This alternative would allocate a lower percentage of vegetation production to livestock than the No Action Alternative and Alternatives I, II, and III and therefore would have fewer impacts to water quality from livestock grazing. Alternative IV would have fewer water quality impaired stream miles available to livestock grazing than the No Action and Alternatives I, II, and III, but more than Alternatives V and VI. Alternative IV-A would have the second fewest miles of water quality impaired Priority 1 and 2 reaches available to livestock grazing; more than Alternative V but less than the other alternatives. Alternative IV-B, similar to Alternative I, would have the third fewest miles of water quality impaired Priority 1 and 2 reaches available to livestock grazing of all alternatives. Alternative IV emphasizes a variety of restoration activities to improve PFC ratings which would improve water quality in water quality impaired streams. Livestock would be temporarily excluded from the restoration areas until restoration objectives are achieved.

Areas unavailable for grazing include ten riparian reference areas (up to 3,000 acres); the same as for Alternatives I and VI. Therefore, the impacts to water quality from riparian reference areas for Alternative IV would be the same as Alternatives I and VI.

The effects of creating reserve common allotments are the same as described for Alternative II. The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Management Specific to Alternative V

This alternative would authorize between 42,000 and 85,000 AUMs for livestock grazing at full implementation. In Alternative V, 57 miles of perennial streams would be available and 260 miles would be unavailable for livestock grazing. The 199 miles of water quality impaired streams available for livestock grazing include 29 miles of water quality impaired Priority 1 and 2 reaches, while the 227 miles of water quality impaired streams unavailable for livestock grazing include 62 miles of water quality impaired Priority 1 and 2 reaches. Areas unavailable for grazing also include six riparian reference areas (23,000 acres). Alternative V would have the fewest miles of water quality impaired streams in areas available to grazing of all alternatives and would have the most miles in riparian reference areas unavailable for livestock grazing. Alternative V would have the least amount of authorized livestock grazing and the least amount of impacts to water quality due to livestock grazing of all alternatives.

Alternative V would allocate the lowest percentage of vegetation production for livestock grazing and authorize the fewest AUMs of all the alternatives. The reduced allocation for livestock is expected to improve riparian condition and water quality in impaired streams where livestock grazing is the reason for water quality impairment; the most of all alternatives.

Reserve common allotments would not be created in Alternative V; instead, forage on acquired land and in allotments where permits are relinquished or cancelled would be held for wildlife habitat and watershed protection, increasing the likelihood for improvements in water quality.

Impacts from Management Specific to Alternative VI (Proposed RMP)

This alternative would authorize between 186,000 and 279,000 AUMs for livestock grazing at full implementation. In Alternative VI, 100 miles of perennial streams would be available and 217 miles would be unavailable for livestock grazing. The 292 miles of water quality impaired streams in areas available for livestock grazing include 49 miles of water quality impaired Priority 1 and 2 reaches, while the 134 miles of water quality impaired streams in areas unavailable for livestock grazing include 41 miles of water quality impaired Priority 1 and 2 reaches. Alternative VI would have more miles of water quality impaired stream available to livestock grazing than Alternatives I, IV, and V but less than the other alternatives. Alternative VI would have the same acres of riparian reference areas as Alternatives I and IV which is more than would occur in Alternatives II and III, and less than Alternative V.

The effects of creating reserve common allotments are the same as described for Alternative II. The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Recreation Actions

Recreational uses in the planning area include activities such as driving, horseback riding, hiking, and camping. These uses can occur in a dispersed manner across the planning area or in concentrated uses in some of the more popular recreational areas. The concentrated recreational activities may cause a loss of ground cover from user-created roads and trails, trampling of vegetation, vegetation removal, and soil compaction within Riparian Conservation Areas (RCAs). These impacts may be similar in type, but of a different magnitude, than the impacts associated with other public land uses. Increased surface erosion can be associated with heavily used hiking or horse trails and motorized recreation areas. High-use campsites may damage riparian vegetation resulting in reduced plant vigor and increased plant mortality. Streambank trampling, camping along the stream margin, fishing, and off-highway vehicle use usually result in localized impacts to the water quality. Dispersed recreation in upland areas have limited to negligible impacts to water quality.

The following indicator was used to analyze the impacts of Recreation actions on water resources:

- Water quality in water quality impaired Priority 1 and 2 reaches within Special Recreation Management Area (SRMA) and Extensive Recreation Management Area (ERMA) designations.

The miles of water quality impaired priority reaches in SRMAs and ERMAs are displayed in Table 4-65. The localized impacts to proper functioning condition (PFC) and habitat condition (HC) ratings and water quality in water quality impaired streams would likely be reduced in SRMAs and ERMAs because those areas would include focused recreation management in compliance with resource objectives to maintain or improve water quality and promote the attainment of state water quality standards and designated beneficial use. The more miles of water quality impaired streams in SRMAs and ERMAs, the more likely for recreation-related impacts to riparian and instream conditions and water quality. The areas of most concern in this analysis are water quality impaired Priority 1 and 2 reaches or restoration reaches where the impairment is due to recreation.

Table 4-65. Water Quality Impaired Priority Reaches in Special Recreation Management Areas and Extensive Recreation Management Areas by Alternative (Miles)

PFC Priority Rating	Alternative					
	I	II	III	IV	V	VI
Priority 1 and 2	39	< 1	< 1	9	0	143
Priority 3	20	2	2	4	< 1	25
Total	**59**	**2**	**2**	**13**	**1**	**168**

[A] In the No Action Alternative, SRMAs were not mapped so riparian condition could not be identified.
[B] Alternative VI is the only alternative with ERMAs and the miles include reaches in both SRMAs and ERMAs.

The miles of perennial stream and HC conservation and restoration reaches included in each SRMA are provided in the *Special Status Fish and Aquatic Invertebrates* section.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative identifies five SRMAs which range in size from the 3,000 acre Hagerman-Owsley Bridge to the 57,000 acre Bruneau-Jarbidge SRMA. However, the five SRMAs were not mapped in the 1987 RMP, so the impacts from management of these SRMAs on water quality are difficult to quantify. Future management of the five SRMAs would be in compliance with the Clean Water Act and state water quality standards, which is expected to maintain water quality within the SRMAs.

Impacts from Management Common to All Action Alternatives

All action alternatives would implement management direction to reduce recreation-related impacts to PFC and HC ratings, which would reduce impacts to water quality impaired streams. The goals and objectives for riparian areas and wetlands to improve riparian and instream condition, as supported by the restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5), are expected to reduce impacts from existing recreation sites and reduce or avoid impacts to water quality from the construction of new recreation sites in or near RCAs. This is expected to maintain or improve water quality in the long term.

Impacts from Management Specific to Alternative I

The seven SRMAs in this alternative include 122 miles of perennial streams. The SRMAs encompass 59 miles of water quality impaired PFC rated streams, of which 39 miles are Priority 1 and 2 reaches. The Priority 1 and 2 reaches are at the greatest risk for impacts to water quality due to their reduced condition. The SRMAs would be designated to accommodate recreation while reducing impacts to water quality through more intensive management. Monitoring recreation use would ensure that impacts to streams would not increase to levels that reduce water quality. This alternative would have the same number of water quality impaired PFC rated stream within areas under SRMA management as Alternative VI but more than the other alternatives. This alternative, similar to Alternative VI, is expected to have the greatest likelihood for a reduction in recreation-related impacts to water quality of all alternatives because if the increased recreation management and monitoring focus.

Impacts from Management Specific to Alternative II

The three SRMAs in this alternative include 17 miles of perennial streams. The Little Pilgrim SRMA, which includes a popular recreation area along the Snake River, encompasses two miles of water quality impaired Priority 3 reaches. The other two SRMAs in the alternative encompass 15 miles of perennial streams of which less than 1 mile are water quality impaired Priority 1 and 2 reaches. Although these SRMAs generally do not overlap current PFC restoration priorities or water quality impaired stream segments, the management plans for these SRMAs would reduce the potential for impacts to water quality from current or future increases in recreational use. Alternative II, similar to Alternative III, would have the second fewest miles of Priority 1 and Priority 2 streams in an SRMA; slightly more than Alternative V but less than the other alternatives. Alternative II, similar to Alternative III, would have the second least likelihood of reducing recreation-related impacts to water quality due to SRMA management; less likely than Alternatives I, IV, and VI but more than Alternative V.

Impacts from Management Specific to Alternative III

The five SRMAs in this alternative include 18 miles of perennial streams. These SRMAs include two miles of water quality impaired streams, with less than one mile being Priority 1 and Priority 2 reaches. This alternative would have the same miles of water quality impaired Priority 1 and 2 reaches in SRMAs as Alternative II and slightly more than Alternative V; the likelihood for a reduction in recreation-related impacts to water quality would be the same as for Alternative II, slightly more than Alternative V, but less than Alternatives I, IV, and VI.

Impacts from Management Specific to Alternative IV

The four SRMAs in this alternative include 58 miles of perennial streams. These SRMAs include 13 miles of water quality impaired PFC rated stream, of which 9 miles are Priority 1 and 2 reaches. SRMA management is expected to reduce recreation-related impacts to water quality which would improve water

quality toward attaining State water quality standards due to the increased management emphasis. This alternative would have more miles of water quality impaired Priority 1 and 2 reaches in SRMAs than Alternatives II, III, and V but less than Alternatives I and VI. It would rank second in likelihood for reducing recreation-related impacts to water quality impaired streams due to increased SRMA management.

Impacts from Management Specific to Alternative V

The two SRMAs in this alternative include seven miles of perennial streams, which is the least of all alternatives. These SRMAs include less than one mile of water quality impaired Priority 3 reach. Although the SRMAs in Alternative V generally do not encompass water quality impaired streams, the management plan for Yahoo SRMA, which includes 0.5 mile of water quality impaired stream, would include actions to reduce recreation-related impacts to water quality. Alternative V would have the fewest miles of water quality impaired streams within a SRMA of all alternatives; similar to but slightly less than Alternatives II and III. Alternative V would have the least likelihood for a reduction in recreation-related impacts to water quality due to SRMA management of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The six SRMAs in this alternative include 13 miles of perennial streams and the four ERMAs would include 109 miles of perennial streams. The combined miles of water quality impaired streams (59 miles) and the miles of water quality impaired Priority 1 and 2 reaches within an SRMA and ERMA (39 miles) would be the same as described for Alternative I. Similar to Alternative I, Alternative VI, would have the most likelihood for a reduction in recreation-related impacts to water quality impaired streams due to SRMA and ERMA management of all alternatives. The effects of SRMAs and ERMAs management on water quality for Alternative VI are the same as Alternative I.

Impacts from Transportation and Travel Actions

Roads contribute substantial amounts of sediment to streams (Furniss et al., 1991). Poorly planned, designed, located, constructed, or maintained roads can degrade riparian areas and fish habitat (see *Impacts from Transportation and Travel Actions* in the *Special Status Fish and Aquatic Invertebrates* section). Roads directly affect natural sediment and hydrologic regimes by altering streamflow patterns, sediment loading, sediment transport and deposition, channel morphology, substrate composition, water quality, and riparian conditions. Sediment is most frequently delivered to streams by drainage ditches leading directly to stream crossings, or by ditch relief pipes that discharge close to streams.

The level of risk to water quality associated with motorized uses is related to the travel designations. Areas open to cross-country motorized vehicle use pose a risk to water quality at a watershed level, which increases the likelihood that travel-related activities are taking place in areas that are more susceptible to impacts such as riparian areas, wetlands, and areas with erosive soils. Motorized use on designated routes poses less risk to water quality since motorized use is occurring on an already-disturbed surface. For these areas, erosion and physical disturbance to stream channels can be addressed through design criteria, maintenance, and road location. Areas closed to motorized use would have the least risk to water quality. However, reclamation of the road segments within the Riparian Conservation Area (RCA) may be necessary to address long-term impacts to water quality.

The following indicator was used to analyze the impacts of Transportation and Travel actions on water resources:

- Water quality in water quality impaired streams by travel designation (in proper functioning condition [PFC] Priority 1 and 2 reaches).

The analysis focuses on Priority 1 and 2 reaches with impaired water quality that are open to cross-country motorized vehicle use or are limited to designated routes. The miles of water quality impaired streams by travel designation are displayed in Table 4-66 and miles of water quality impaired PFC rated streams by priority are displayed in Table 4-67. The miles of perennial stream and habitat condition (HC) conservation and restoration reaches by travel designation can be found in the *Special Status Fish and Aquatic Invertebrates* section.

Table 4-66. Water Quality Impaired Streams by Travel Designation by Alternative (Miles)

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Open to Cross-Country Motorized Vehicle Use	115	< 1	0	< 1	< 1	< 1	< 1
Limited to Designated Routes or Seasonal Restrictions	139	208	224	212	176	172	212
Limited to Designated Routes - Motorized and Mechanized Off-Highway Vehicles (OHVs)	119	158	160	160	160	158	160
Closed to Motorized and Mechanized Travel - Wilderness	22	22	22	22	22	22	22
Closed to Motorized Vehicle Use	32	38	21	32	68	75	32
Total	**427**	**427**	**427**	**427**	**427**	**427**	**427**

Table 4-67. Water Quality Impaired Priority Reaches by Travel Designation by Alternative (Miles)

PFC Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
Open to Cross-Country Motorized Vehicle Use							
Priority 1 and 2	18	0	0	0	0	0	0
Priority 3	13	< 1	0	< 1	< 1	< 1	< 1
Total	**31**	**< 1**	**0**	**< 1**	**< 1**	**< 1**	**< 1**
Limited to Designated Routes or Seasonal Restrictions							
Priority 1 and 2	25	31	31	31	24	24	31
Priority 3	19	23	26	27	24	20	27
Total	**44**	**54**	**57**	**58**	**48**	**44**	**58**
Limited to Designated Routes (Motorized and Mechanized OHV)							
Priority 1 and 2	35	47	47	47	47	47	47
Priority 3	3	8	8	8	8	8	8
Total	**38**	**55**	**55**	**55**	**55**	**54**	**54**
Closed to Motorized and Mechanized Vehicle Use (Wilderness)							
Priority 1 and 2	13	13	13	13	13	13	13
Priority 3	0	0	0	0	0	0	0
Total	**13**	**13**	**13**	**13**	**13**	**13**	**13**
Closed to Motorized Use							
Priority 1 and 2	0	0	0	0	7	7	0
Priority 3	0	4	0	0	3	6	0
Total	**0**	**4**	**0**	**0**	**10**	**13**	**0**

Impacts from Management Specific to the No Action Alternative

The areas open to cross country travel include 115 miles of water quality impaired streams. Within the open areas, there are 68 miles of perennial streams; 18 miles are Priority 1 and Priority 2 reaches. The No Action Alternative is the only alternative where water quality impaired streams occur in areas open to cross-country use. These areas pose the greatest risk for transportation and travel-related impacts to water quality.

The areas with travel limited to designated routes or by seasonal restrictions include 258 miles of water quality impaired streams. Within these areas, there are 135 miles of perennial streams; 60 of these miles

are Priority 1 and 2 reaches. The No Action Alternative has the fewest miles of water quality impaired streams and water quality impaired Priority 1 and 2 reaches in areas with travel limited to designated routes of all alternatives. The travel limited areas for the No Action Alternative would have the greatest potential to impact water quality of all alternatives.

There would be 54 miles of water quality impaired streams in areas closed to motorized and mechanized motor vehicle use. Within these areas, there are 115 miles of perennial streams; 13 of these miles are Priority 1 and 2 reaches. The No Action Alternative, similar to Alternatives III and VI, would have the second fewest miles of water quality impaired streams in areas closed to motorized and mechanized travel; more than Alternative II but less than the other alternatives. The No Action Alternative, similar to Alternatives II, III, and VI, has the fewest miles of Priority 1 and Priority 2 reaches in areas closed to motorized and mechanized travel of all alternatives; less than Alternatives I, IV, and VI.

The No Action Alternative contains management direction for roads to avoid riparian areas to the extent practical; it provides no direction for reducing route density, eliminating duplicate roads (i.e., roads with same destination), reducing road surface erosion to streams, or improving stream crossings to reduce impacts to water quality impaired streams. The No Action Alternative would have the most risk for impacts to water quality from travel designations of all alternatives.

Impacts from Management Common to All Action Alternatives

Travel management activities in riparian areas would include direction to improve water quality as supported by the restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5). This would reduce impacts from existing roads and for avoiding construction of new roads in RCAs unless a site-specific analysis indicates short-term effects would result in the achievement of riparian and water quality objectives in the long term. This is expected to improve PFC and HC ratings and reduce impacts to water quality which would promote attaining or moving toward State water quality standards.

Developing a Travel Management Plan would provide a site-specific analysis to identify road closures, travel restrictions, or other travel management adjustments to reduce impacts on RCAs. Short-term effects and long-term improvements to PFC and HC ratings and water quality would occur as a result of road improvement projects, culvert replacements, and route closures or road rehabilitation.

Impacts from Management Specific to Alternative I

The areas open to cross country travel would be in the Deadman/Yahoo Special Recreation Management Area (SRMA); the rest of the planning area would be closed to motorized cross-country travel. The SRMA would encompass less than one mile of Priority 3 water quality impaired stream. The effects of cross-country travel on water quality across large portions of the planning area would be reduced to less than one mile within the SRMA. Management direction for the SRMA would maintain the PFC rating for the water quality impaired reach within the SRMA. Even though motorized cross-country travel would not be authorized along perennial or intermittent streams, exceptions may be granted to BLM permit, lease, or right-of-way (ROW) holders or may be allowed on a case-by-case basis for non-BLM government entities. Cross-country motorized vehicle use in RCAs or wetlands would locally reduce water quality, but the potential for impacts would be minimized with the requirement for BLM permit. Localized impacts to RCAs and water quality are expected from allowing game retrieval using motorized vehicles 300 feet off designated routes except in closed areas for this use. Motorized cross-country travel 25 feet off designated routes to access a camp site is less likely to affect RCAs or wetlands as it would not be allowed in riparian areas.

The areas with travel limited to designated routes or by seasonal restrictions would include 366 miles of water quality impaired streams. Within these areas, there are 180 miles of perennial streams; 78 of these miles are Priority 1 and 2 reaches. Limiting motorized and mechanized use to designated routes or seasonal restrictions would poses less risk to water quality since travel occurs on an already-disturbed surface. Erosion and physical disturbance to stream channels could be reduced through adjustments in road design criteria, maintenance, location and seasonal restrictions. However, roads in RCAs impact PFC and HC ratings, which pose an increased risk for impacts to water quality. Alternative I would have

more miles of water quality impaired streams in areas with travel limited to designated routes or with seasonal restrictions than the No Action Alternative but less than Alternatives II, III, and VI. There would be the same miles of water quality impaired Priority 1 and 2 reaches in areas with travel limited to designated routes as Alternatives II, III, and VI but more than the No Action Alternative and Alternatives IV and V.

There would be 60 miles of water quality impaired streams in areas closed to motorized and mechanized motor vehicle use. Within these areas, there are 137 miles of perennial streams; 13 of these miles are Priority 1 and 2 reaches. Alternative I has more miles of water quality impaired streams in areas closed to motorized and mechanized use than the No Action Alternative and Alternatives II, III, and VI but less than Alternatives IV and V. It would have the same number of miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized use as the No Action Alternative and Alternatives II, III, and VI which is less than for Alternatives IV and V. Alternative I, similar to the No Action Alternative and Alternatives II, III, IV, and VI, would rank second of all alternatives in reducing impacts to water quality in Priority 1 and 2 reaches relative to areas closed to motorized and mechanized travel.

Travel designations in Alternative I compared to the No Action Alternative would have more improvement in PFC ratings and water quality which would promote water quality impaired streams moving toward or achieving water resource objectives; most of the improvement would occur on water quality impaired Priority 1 and 2 reaches.

Impacts from Management Specific to Alternative II

The widely occurring impacts from cross-country motorized vehicle use on water quality would no longer occur because the entire planning are would be closed to cross-country motorized vehicle use; however, localized impacts to PFC ratings and water quality impaired streams may occur as Alternative II would not restrict game retrieval off designated routes and would allow motorized cross-country travel 100 feet off designated routes to access a camp site.

The areas with travel limited to designated routes or by seasonal restrictions would include 383 miles of water quality impaired streams. Within these areas, there are 213 miles of perennial streams; 78 of these miles are Priority 1 and 2 reaches. Alternative II has the most miles of water quality impaired streams in areas with motorized and mechanized travel limited to designated routes or by seasonal restrictions of all alternatives. The miles of travel limited to designated routes or by seasonal restrictions for water quality impaired Priority 1 and 2 reaches would be the same as for Alternatives I, III, and VI, which is more than for the No Action Alternative and Alternatives IV and V.

There would be 43 miles of water quality impaired streams in areas closed to motorized and mechanized motor vehicle use. Within these areas, there are 104 miles of perennial streams; 13 of these miles are Priority 1 and 2. Alternative II has the fewest miles of water quality impaired streams closed to motorized and mechanized vehicle use of all alternatives. Alternative II would have the same miles of Priority 1 and Priority 2 reaches in areas closed to travel as the No Action Alternative and Alternatives I, III, and VI, which is less than for Alternatives IV and V.

Travel designations in Alternative II would impact water quality less than the No Action alternative but would be similar to Alternatives I, III, and VI in reducing impacts to water quality and promoting water quality impaired streams moving toward or achieving water resource objectives over the life of the plan. However, adverse impacts to water quality would be higher than for Alternatives IV and V because these alternatives have more areas closed to motorized travel.

Impacts from Management Specific to Alternative III

The impacts from cross-country motorized vehicle use on water quality are the same as described for Alternative I; however, the area impacted may decrease as Alternative III would not allow game retrieval off designated routes. Impacts to water quality would be similar to but slightly less than Alternative I.

The areas with travel limited to designated routes or by seasonal restrictions would include 372 miles of water quality impaired streams. Within these areas, there are 202 miles of perennial streams; 78 of these miles are Priority 1 and 2 reaches. Alternative III has the second most miles of water quality impaired

streams in areas with motorized and mechanized travel limited to designated routes or by seasonal restrictions of all alternatives; similar to Alternative VI, less than Alternative II, but more than the other alternatives. Alternative III has the same miles of Priority 1 and 2 reaches of water quality impaired streams within areas designated as limited travel as Alternatives I, II, and VI; the impacts of limited travel designation on water quality impaired streams would be the same as described for Alternative I.

There would be 54 miles of water quality impaired streams in areas closed to motorized and mechanized motor vehicle use. Within these areas, there are 115 miles of perennial streams; 13 of these miles are Priority 1 and 2. Alternative III has the same miles of water quality impaired streams in areas closed to travel as the No Action Alternative and Alternative VI which is more than Alternative II but less than Alternatives IV and V. Alternative III would have the same miles of Priority 1 and 2 reaches in areas closed to travel as the No Action Alternative and Alternatives I, II, and VI, which is less than for Alternatives IV and V.

Travel designations in Alternative III would impact water quality less than the No Action alternative but would be similar to Alternatives I, II, and VI in reducing impacts to water quality and promoting water quality impaired streams moving toward or achieving water resource objectives over the life of the plan. However, adverse impacts to water quality would be higher than for Alternatives IV and V because these alternatives have more areas closed to motorized travel.

Impacts from Management Specific to Alternative IV

The impacts from cross-country motorized vehicle use on water quality are the same as described for Alternative I; however, the area impacted may decrease as Alternative IV would not allow game retrieval off designated routes.

The areas with travel limited to designated routes or by seasonal restrictions would include 336 miles of water quality impaired streams. Within these areas, there are 195 miles of perennial streams; 71 of these miles are Priority 1 and 2 reaches. Alternative IV has more miles of water quality impaired streams in areas with motorized and mechanized travel limited to designated routes or by seasonal restrictions than the No Action Alternative and Alternative V but less than the other alternatives. Alternative IV has the same miles of Priority 1 and 2 reaches of water quality impaired streams within areas designated as limited travel as Alternative V which is more than the No Action Alternative but less than the other alternatives.

There would be 90 miles of water quality impaired streams in areas closed to motorized and mechanized motor vehicle use. Within these areas, there are 123 miles of perennial streams; 20 of these miles are Priority 1 and 2. Alternative IV has fewer miles of water quality impaired streams and miles of Priority 1 and 2 reaches in areas closed to travel than Alternative V but more than the other alternatives. Therefore, it would have the second fewest risk for impacts to water quality with slightly more risk than for Alternative V.

Travel designations for Alternative IV would promote water quality impaired streams moving toward or achieving water resource objectives over the life of the plan more than the No Action Alternative and Alternatives I, II, III, and VI, and to a similar degree as Alternative V, although slightly fewer miles of water quality impaired streams would be closed to motorized use.

Impacts from Management Specific to Alternative V

This alternative would have the least impacts from cross-country motorized vehicle use on water quality compared to any other alternative, as no exceptions to motorized vehicle restrictions would be granted to permit, lease, and ROW holders or for game retrieval. Access to recreation sites would be limited to 25 feet of designated routes and would not be allowed in RCAs; the impacts to water quality impaired streams would be similar to those described for Alternative I. The only area open to cross-country motorized vehicle use would be in the 700-acre Yahoo SRMA, which encompass less than one mile of Priority 3 water quality impaired perennial stream. Management direction for the SRMA would maintain the PFC rating for the water quality impaired reach within the SRMA.

The areas with travel limited to designated routes or by seasonal restrictions would include 330 miles of water quality impaired streams. Within these areas, there are 172 miles of perennial streams; 71 of these miles are Priority 1 and 2 reaches. Alternative V has more miles of water quality impaired streams in areas with motorized and mechanized travel limited to designated routes or by seasonal restrictions than the No Action Alternative but less than the other alternatives. Alternative V has the same miles of Priority 1 and 2 reaches of water quality impaired streams within areas designated as limited travel as Alternative IV, which is more than the No Action Alternative but less than the other alternatives.

There would be 97 miles of water quality impaired streams in areas closed to motorized and mechanized motor vehicle use which is the most of all alternatives. Within these areas, there are 145 miles of perennial streams; 20 of these miles are Priority 1 and 2. Alternative V has the most miles of water quality impaired Priority 1 and Priority 2 reaches in areas closed to travel; therefore, it would pose the least risk to water quality impaired streams of all the alternatives. Alternative V would have the same miles of Priority 1 and 2 reaches in areas closed to travel as Alternative IV, which is more than for the other alternatives.

Travel designations in Alternative V would result in the fewest impacts to water quality of all alternatives, which would promote more water quality impaired streams moving toward or achieving water resource objectives over the life of the plan of all alternatives as they relate to travel designations.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The impacts from cross-country motorized vehicle use on water quality are the same as described for Alternative I; however, the area impacted would be slightly less as game retrieval off designated routes would not be allowed. The impacts to PFC ratings in water quality impaired streams from motorized cross-country travel to access a camp site would be the same as Alternative II, except seasonal use restrictions would be applied if dispersed camping results in localized reductions in PFC and HC ratings and water quality.

The areas with travel limited to designated routes or by seasonal restrictions would include 372 miles of water quality impaired streams. Within these areas, there are 202 miles of perennial streams; 78 of these miles are Priority 1 and 2 reaches. Alternative VI has the same miles of water quality impaired stream in areas with motorized and mechanized travel limited to designated routes or by seasonal restrictions as Alternative III, which is less than for Alternative II but more than the other alternatives. Alternative VI has the same miles of Priority 1 and 2 reaches of water quality impaired streams within areas designated as limited travel as Alternatives I, II, and III; the impacts are the same as for Alternative I.

There would be 54 miles of water quality impaired stream in areas closed to motorized and mechanized motor vehicle use which is the same as for the No Action Alternative and Alternative III; more than for Alternative II but less than the other alternatives. Within these areas, there are 115 miles of perennial streams; 13 of these miles are Priority 1 and 2. Alternative VI, along with the No Action Alternative and Alternatives II and III, have fewer miles of water quality impaired Priority 1 and Priority 2 reaches in areas closed to travel than Alternatives IV and V; therefore, it would pose an increased risk to water quality impaired streams as compared to Alternatives IV and V.

Travel designations in Alternative VI would promote water quality impaired streams moving toward or achieving water resource objectives to a similar degree as Alternatives I and III.

Impacts from Land Use Authorizations Actions

The impacts from land use authorizations on water resources vary by the type of authorization, location and season of use, duration of use, and proximity of use to streams. Some uses, such as powerlines, phone lines, and communication sites in uplands, would have little or no impacts to water resources. Other land uses authorizations, such as roads, water developments, ditches, wind energy infrastructure, and other surface-disturbing uses, have potential to impact water quality depending on their proximity to streams. Energy development, such as wind energy, in itself does not pose a threat to water resources. The risk to water resources comes from the roads and physical disturbances that accompany energy development. Many of the effects from roads and transmission lines may be addressed through best

management practices (BMPs); however, as the level of development increases, there is a corresponding increase in the level of risk to water quality.

The following indicator was used to analyze the impacts of Land Use Authorizations actions on water resources:

- Water quality in water quality impaired streams within areas available for land use authorizations (in proper functioning condition [PFC] Priority 1 and 2 reaches).

In general, impacts to water quality from new land use authorizations are not expected to occur in the right-of-way (ROW) exclusion areas; impacts to water quality could occur in the ROW avoidance areas. The areas that are not within ROW exclusion or avoidance areas would have the greatest potential to impact water quality, with the most risk for impacts to water quality occurring in the water quality impaired Priority 1 and 2 reaches. The greatest impacts to water quality from utility ROW corridor development would occur where utilities are buried in Riparian Conservation Areas (RCAs) or where new stream crossings are created to construct and maintain utility ROW corridors.

The miles of water quality impaired priority reaches in ROW avoidance and exclusion areas and in areas available for ROW authorizations are displayed in Table 4-68. The miles of water quality impaired streams within utility ROW corridors varied slightly between alternatives and are provided in the discussion below.

Table 4-68. Water Quality Impaired Priority Reaches in Right-of-Way Avoidance Areas, Exclusion Areas, and Areas Available for Rights-of-Way by Alternative (Miles)

PFC Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
Row Exclusion Areas							
Priority 1 and 2	13	13	13	13	20	20	13
Priority 3	0	2	0	2	5	9	2
Total	**13**	**15**	**13**	**15**	**25**	**29**	**15**
Row Avoidance Areas							
Priority 1 and 2	68	68	68	68	68	88	88
Priority 3	18	18	18	18	18	32	32
Total	**86**	**86**	**86**	**86**	**86**	**121**	**121**
Row Available Areas							
Priority 1 and 2	22	22	22	22	16	2	2
Priority 3	16	16	16	16	13	2	2
Total	**38**	**38**	**38**	**38**	**29**	**4**	**4**

Roads associated with wind energy development projects that occur within RCAs have impacts to stream channel conditions (habitat condition [HC]), riparian vegetation (PFC), and water quality (designation as water quality impaired). The use of culverts or bridges directly influences the long-term impacts to PFC and HC ratings and water quality in and below areas where roads cross a stream. Wind energy development projects can also have short-term impacts to instream flows if surface water is required for road construction or reconstruction, dust abatement on roads or equipment staging areas, or mixing with concrete to construct tower foundations. The impacts to RCAs from removing surface water vary by location, season, amount, and rate of withdrawal. The miles of water quality impaired priority reaches in wind energy development areas are displayed in Table 4-69.

Table 4-69. Water Quality Impaired Priority Reaches in Expected Wind Energy Development Areas by Alternative (Miles)

PFC Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
Priority 1 and 2	14	< 1	19	3	< 1	< 1	2

PFC Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
Priority 3	4	< 1	11	1	< 1	< 1	< 1
Total	**18**	**1**	**30**	**4**	**1**	**1**	**3**

Perennial stream miles affected by ROW avoidance and exclusion areas, utility ROW corridors, and expected wind energy development areas and HC conservation and restoration reaches affected by ROW avoidance and exclusion areas and expected wind energy development areas are in the *Special Status Fish and Aquatic Invertebrates* section.

Impacts from Management Specific to the No Action Alternative

ROW avoidance and exclusion areas would encompass 258 miles of water quality impaired streams; 125 of these miles are water quality impaired perennial streams. PFC ratings were completed on 99 of these miles; 81 miles are water quality impaired Priority 1 and 2 reaches. This alternative identifies riparian areas as ROW avoidance areas and provides general direction for avoiding utility ROW corridors or associated infrastructure in areas where water quality would be affected. The direction for issuing ROWs is limited to general direction to avoid riparian areas to the extent practical which would maintain water quality where ROWs are authorized. The No Action Alternative would have one less mile of water quality impaired stream in ROW avoidance an exclusion areas than for Alternatives I, II, and III; the risks to water quality are essentially the same for these four alternatives. The No Action Alternative, similar to Alternatives I, II, and III would have fewer miles of water quality impaired streams within ROW avoidance and exclusion areas than for Alternatives IV, V, and VI. Therefore, it would have more risk for impacts to water quality than for Alternatives IV, V, and VI.

There would be 168 miles of water quality impaired streams in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas. Of these miles, 57 miles are perennial streams. PFC ratings were completed on 38 of these miles; 22 miles are Priority 1 and 2 reaches and would be at most risk to impacts to water quality due to ROW development. The No Action Alternative would have one more mile of water quality impaired streams in areas available for ROW authorizations than Alternatives I, II, and III; the risk for impacts to water quality are essentially the same for these four alternatives. The No Action Alternative would have more risk for impacts to water quality than for Alternatives IV, V, and VI.

Utility ROW corridors would encompass five miles of water quality impaired streams; two miles are water quality impaired perennial streams. PFC ratings were completed on two miles of streams, all of which were Priority 3 reaches. The current management provides general direction for avoiding utility ROW corridors or associated infrastructure in areas where water quality would be affected. Water quality would be expected to be maintained in these areas. The No Action Alternative would have the fewest miles of water quality impaired stream in utility ROW corridors of all alternatives and would pose the least risk to water quality due to utility ROW corridors of all alternatives.

Expected wind energy development areas for the No Action Alternative contain 84 miles of water quality impaired streams; 27 of these miles are water quality impaired perennial streams. PFC assessments were completed on 18 of these miles; 14 miles are water quality impaired Priority 1 and 2 reaches. This alternative has the second most miles of water quality impaired streams and water quality impaired Priority 1 and 2 reaches within expected wind energy development areas of all alternatives; less than Alternative II but more than the other alternatives. The No Action Alternative would pose the second greatest risk to water quality from the expected wind energy development.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All alternatives would adopt programmatic policies and BMPs for wind energy development projects, which would provide mitigation to reduce impacts to riparian areas and wetlands and reduce impacts to water quality.

The ROW exclusion areas vary slightly between the No Action Alternative and all action alternatives as do the miles of perennial stream, water quality impaired stream, and PFC rated stream. The ROW exclusion areas would not allow for ROW authorizations. Therefore, impacts to water quality are not expected to occur due to ROW authorizations for any of the alternatives.

Impacts from Management Common to All Action Alternatives

All existing and new ROWs on public land would comply with the goals and objectives for riparian areas and wetlands, using the restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4 and D-5), which would improve PFC and HC ratings, and water quality. The guidance in Appendix B and the direction in Appendix E would also provide measures to reduce impacts from land use authorizations on PFC and HC ratings on water quality impaired streams.

Impacts from Management Specific to Alternative I

ROW avoidance and exclusion areas would encompass 259 miles of water quality impaired streams; 125 of these miles are water quality impaired perennial streams. PFC ratings were completed on 101 of these miles; 81 miles are water quality impaired Priority 1 and 2 reaches. All 81 miles of water quality impaired Priority 1 and 2 reaches within ROW avoidance or exclusion areas are expected to move toward meeting State water quality standards. The risk for impacts to water quality for Alternative I would be the same as for the No Action Alternative and Alternatives II and III, which is more than for Alternatives IV, V, and VI.

There would be 167 miles of water quality impaired streams in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas. PFC ratings were completed on 38 of these miles; 22 miles are water quality impaired Priority 1 and 2 reaches and would be at most risk to impacts to water quality due to ROW development. Alternative I would have the same miles of water quality impaired streams in areas available for ROW authorization as Alternatives II and III, which is more than for Alternatives IV, V, and VI. Alternative I, similar to Alternatives II and III, would pose the most risk to water quality from ROW authorizations of all alternatives.

Utility ROW corridors would encompass nine miles of water quality impaired streams; two miles are water quality impaired perennial streams. PFC assessments were completed on three miles of these streams; one mile is a Priority 1 and 2 reach. A majority of the utility ROW corridors are located in upland areas and would have limited impacts, if any, to PFC and HC ratings or water quality. Portions of these corridors cross water quality impaired streams and would have the potential to impact water quality. Alternative I would have the same miles of water quality impaired streams in utility ROW corridors as Alternatives II, III, IV, and V which is more than for the No Action Alternative. Alternative I, similar to Alternatives II, III, IV, and V, would have more risk for impacts to water quality impaired streams in utility ROW corridors than the No Action Alternative; however, overall the risk for impacts to water quality is low due to the low miles of water quality impaired stream encompassed within the utility corridors.

Expected wind energy development areas contain four miles of water quality impaired streams; all of which are perennial. PFC assessments were completed on less than one of these miles. The expected wind development areas containing surface water would generally be along the Snake River from the Hagerman Fossil Beds National Monument to the town of Hammett, and east of Salmon Falls Creek near Salmon Dam. Alternative I would have the same miles of water quality impaired Priority 1 and 2 reaches in areas of expected wind energy development as for Alternatives IV and V, which is the least of all alternatives. This alternative would rank fifth in miles of water quality impaired stream at risk for impacts due to expected wind energy development.

Impacts from Management Specific to Alternative II

The ROW avoidance and exclusion areas would encompass the same miles of water quality impaired streams and basically the same miles of water quality impaired Priority 1 and 2 reaches as Alternatives I and III. The impacts to water quality would be the same as for Alterative I.

The miles of water quality impaired stream and miles of Priority 1 and 2 reaches in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas would be the same as for Alternatives I and III. The impacts would be the same as described for Alternative I.

The utility ROW corridors would encompass the same miles of water quality impaired streams and Priority 1 and 2 reaches as Alternative I. The effects of utility ROW corridors are the same as described for Alternative I.

Expected wind energy development areas contain 104 miles of water quality impaired streams; 40 of these miles are perennial. PFC assessments were completed on 30 of these miles; 19 miles are water quality impaired Priority 1 and 2 reaches. The expected wind development areas containing surface water would generally be in the same areas described for Alternative I, but would also include a portion of the Jarbidge Foothills near China Mountain and along the upper Bruneau River and Jarbidge Rivers. Alternative II has the most miles of water quality impaired streams and Priority 1 and 2 reaches in expected wind energy development areas of all alternatives, and therefore has the most risk for impacts to water quality of all alternatives.

Impacts from Management Specific to Alternative III

The ROW avoidance and exclusion areas would encompass the same miles of water quality impaired streams and the same miles of water quality impaired Priority 1 and 2 reaches as Alternatives I and II. The impacts to water quality would be the same as described for Alterative I.

The miles of water quality impaired stream and miles of Priority 1 and 2 reaches in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas for Alternative III would be the same as for Alternatives I and II. The impacts would be the same as described for Alternative I.

The utility ROW corridors would encompass the same miles of water quality impaired streams and Priority 1 and 2 reaches as Alternative I. The effects of utility ROW corridors are the same as described for Alternative I.

The expected wind development areas contain 15 miles of water quality impaired streams; 8 of these miles are perennial stream. PFC assessments were completed on four miles of these streams; three of these miles are Priority 1 and 2 reaches. Expected wind energy development areas would be in the same general areas described for Alternative I, except small areas near Cedar Creek reservoir, China Mountain and the Bruneau River would be included. The risks to water quality impaired streams and Priority 1 and 2 reaches for expected wind energy development areas would be more than for Alternatives I, IV, V, and VI. Alternative III would have fewer risks to water quality impaired streams than the No Action Alternative and Alternative II.

Impacts from Management Specific to Alternative IV

ROW avoidance and exclusion areas would encompass 297 miles of perennial and intermittent water quality impaired streams; 134 of these miles are water quality impaired perennial streams. The ROW avoidance and exclusion areas include 111 miles of PFC rated streams; 88 miles of water quality impaired Priority 1 and Priority 2 stream reaches. Alternative IV would have more miles of water quality impaired Priority 1 and 2 reaches in ROW avoidance and exclusion areas than the No Action Alternative and Alternatives I, II, and III but less than Alternatives V and VI. Alternative IV would pose more risks to water quality than Alternatives V and VI but less than the other alternatives.

There would be 129 miles of water quality impaired stream in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas; 48 of these miles are water quality impaired perennial streams. PFC ratings were completed on 29 of these miles; 16 miles are water quality impaired Priority 1 and 2 reaches and would be at most risk to impacts to water quality due to ROW development. Alternative IV would have fewer miles of water quality impaired stream and water quality impaired Priority 1 and 2 reaches in areas available for ROW authorization than the No Action Alternative and Alternatives I, II, and III but more than Alternatives V and VI.

The utility ROW corridors would encompass the same miles of water quality impaired streams and Priority 1 and 2 reaches as Alternative I. The effects of utility ROW corridors are the same as described for Alternative I.

The miles of water quality impaired stream in expected wind energy development areas are the same as Alternative I. The impacts to water quality from these developments are the same as Alternative I.

Impacts from Management Specific to Alternative V

ROW avoidance and exclusion areas would encompass 403 miles of perennial and intermittent water quality impaired streams; 169 of these miles are water quality impaired perennial streams. The ROW avoidance and exclusion areas include 150 miles of PFC rated streams and 108 miles of water quality impaired Priority 1 and Priority 2 stream reaches. Alternative V would have the second most miles of water quality impaired stream in ROW avoidance and exclusion areas of all alternatives; one mile less than Alternative VI but more than the other alternatives. It would have the most miles of water quality impaired priority reaches in ROW avoidance and exclusion areas of all alternatives. Alternative V, similar to Alternative VI, would pose the least risk for impacts to water quality within ROW avoidance and exclusion areas of all alternatives.

There would be 23 miles of water quality impaired stream in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas; 12 of these miles are water quality impaired perennial streams. PFC ratings were completed on four of these miles; two miles are water quality impaired Priority 1 and 2 reaches and would be at most risk to impacts to water quality due to ROW development. Alternative V would have one more mile of water quality impaired stream in areas available for ROW development than Alternative VI, which is less than the other alternatives; it would have the second least risk for impacts to water quality impaired streams. Alternative V would have the same miles of water quality impaired Priority 1 and 2 reaches in areas available for ROW development as Alternative VI, the least of all alternatives. Alternative V would have the second lowest risk for impacts to water quality due to ROW development of all alternatives; less than Alternative VI but more than the other alternatives.

The utility ROW corridors would encompass the same miles of water quality impaired streams and Priority 1 and 2 reaches as Alternative I. The effects of utility ROW corridors are the same as Alternative I.

Expected wind development areas for Alternative V would encompass the same miles of water quality impaired streams as Alternatives I and IV. The impacts to water quality are the same as Alternative I. Alternative V, along with Alternatives I and IV, would have the second fewest miles of water quality impaired stream in expected wind development areas; one mile more than for Alternative VI. Alternative V would have the second fewest risk for impacts to water quality from the expected wind energy development areas of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

ROW avoidance and exclusion areas would encompass 404 miles of perennial and intermittent water quality impaired streams; 169 of these miles are water quality impaired perennial streams. The ROW avoidance and exclusion areas include 136 miles of PFC rated streams; 101 miles of water quality impaired Priority 1 and Priority 2 stream reaches. Alternative VI would have the most miles of water quality impaired stream in ROW avoidance and exclusion areas of all alternatives; similar to but one mile more than for Alternative V. Alternative VI, similar to Alternative V, would have the fewest impacts to water quality related to ROW authorizations within avoidance and exclusion areas. It would have the second most miles of water quality impaired Priority 1 and 2 reaches in ROW avoidance and exclusion areas of all alternatives; fewer than Alternative V but more than the other alternatives. Alternative VI, similar to Alternative V, would pose the least risk for impacts to water quality within ROW avoidance and exclusion areas of all alternatives.

There would be 22 miles of water quality impaired stream in areas available for ROW authorizations that are not within the ROW exclusion or ROW avoidance areas; 12 of these miles are water quality impaired perennial streams. PFC ratings were completed on four of these miles; two miles are water quality impaired Priority 1 and 2 reaches and would be at most risk to impacts to water quality due to ROW development. Alternative VI would have the fewest miles of water quality impaired stream in areas available for ROW development of all alternatives and would pose the least risk to water quality due to ROW development. Alternative VI would have the same miles of water quality impaired Priority 1 and 2

reaches in areas available for ROW development as Alternative V, which is the least of all alternatives. Alternative VI, similar to Alternative V, would have the least risk for impacts to water quality due to ROW development of all alternatives.

The utility ROW corridors would encompass nine miles of water quality impaired streams; four miles are water quality impaired perennial streams. PFC ratings were completed on three miles of these streams; one mile is a Priority 1 and 2 reach. Alternative VI is the only alternative that includes a section of buried utility ROW corridor. There is less than one mile of water quality impaired perennial stream within this corridor. This section of corridor is expected to pose a greater risk for impacts to water quality than for the corridor sections with overhead lines. Because development could affect up to four miles of water quality impaired perennial streams rather than the two mile length in the other alternatives, the impacts from Alternative VI would be similar to but slightly more than Alternatives I, II, III, IV, and V due to the risk for impacts to water quality from the buried utility corridor.

The expected wind energy development areas would contain three miles of water quality impaired streams. PFC assessments were completed on all three miles; two miles are Priority 1 and 2 reaches. The expected wind development areas would generally be along the Snake River from the Hagerman Fossil Beds National Monument to the town of Hammett, Idaho. The expected wind energy development areas would include the fewest miles of water quality impaired streams in areas of expected wind energy development areas of all alternatives; thus, it would have the least risk for impacts to water quality of all alternatives. Alternative VI would have more miles of water quality impaired Priority 1 and 2 reaches in areas of expected wind energy development than Alternatives I, IV, and V but less than the other alternatives.

Impacts from Minerals Actions

Leasable minerals include energy resources such as oil, gas, and geothermal as well as other non-energy minerals such as phosphate and sulfur. The development of geothermal resources could impact water quality due to the removal of surface or subsurface water or due to infrastructure and transportation systems related to these projects. Activities associated with oil and gas development could have similar effects to water quality.

Some aspects of oil and gas or geothermal exploration and development, such as blasting, consumptive and non-consumptive use of surface or groundwater, disposal of waste water, and general surface disturbance of Riparian Conservation Areas (RCAs), would reduce proper functioning condition (PFC) and habitat condition (HC) ratings and would impact water quality where these activities occur within or adjacent to RCAs. No surface occupancy restrictions would avoid direct impacts to riparian areas, but indirect impacts to PFC and HC ratings or water quality could occur where activities associated with minerals exploration or development occurs within or adjacent to RCAs at any time of the year.

The following indicator was used to analyze the impacts of Mineral actions on water resources:

- Water quality in water quality impaired streams within areas available for leasable, salable and locatable mineral development (in PFC Priority 1 and 2 reaches).

The miles of water quality impaired priority reaches open and closed to leasing in potential oil and gas and potential geothermal areas are displayed in Table 4-70 and Table 4-71. Water quality impaired Priority 1 and 2 reaches are at more risk from impacts of oil and gas development than the Priority 3 reaches due to their reduced condition. The more miles of Priority 1 and 2 reaches open to leasing, the greater the risk for impacts to water quality. The areas open to mineral leasing are expected to pose a greater risk for impacts to water quality than the areas open with restrictions for seasonal, surface or controlled use or with no surface occupancy.

Table 4-70. Water Quality Impaired Priority Reaches Open or Closed to Leasing in Expected Oil and Gas Areas by Alternative (Miles)

PFC Priority Rating	Alternative					
	I	II	III	IV	V	VI
Open						
Priority 1 and 2	18	25	21	14	11	21
Priority 3	11	23	12	9	9	12
Total	**29**	**48**	**33**	**23**	**20**	**33**
Closed						
Priority 1 and 2	7	0	5	11	14	5
Priority 3	12	0	11	14	15	11
Total	**19**	**0**	**16**	**25**	**29**	**16**

[A] The No Action Alternative identifies the majority of the planning area as open to mineral leasing, but does not identify specific boundaries.
[B] Includes areas open with surface occupancy, seasonal, and/or controlled surface use restrictions as well as areas open for leasing without these restrictions.

Table 4-71. Water Quality Impaired Priority Reaches Open or Closed to Leasing in Expected Geothermal Areas by Alternative (Miles)

PFC Priority Rating	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Medium Potential for Geothermal Development							
Open							
Priority 1 and 2	0	4	2	2		0	2
Priority 3	1	11	2	2		1	2
Total	**1**	**15**	**4**	**4**		**1**	**4**
Closed							
Priority 1 and 2	4	0	2	2		4	2
Priority 3	92	0	9	9		9	9
Total	**13**	**0**	**11**	**11**		**13**	**11**
Low Potential for Geothermal Development							
Open							
Priority 1 and 2	67	74	67	58	61	60	67
Priority 3	20	24	20	18	18	18	20
Total	**87**	**98**	**87**	**76**	**79**	**78**	**87**
Closed							
Priority 1 and 2	20	13	20	29	27	27	20
Priority 3	4	0	4	6	6	6	4
Total	**24**	**13**	**24**	**35**	**33**	**33**	**24**

[A] The No Action Alternative identifies the majority of the planning area as open to mineral leasing, but does not identify specific boundaries.
[B] Includes areas open with surface occupancy, seasonal, and/or controlled surface use restrictions as well as areas open for leasing without these restrictions.

Miles of perennial streams and HC conservation and restoration reaches in potential oil and gas areas and potential geothermal areas are displayed in the *Special Status Fish and Aquatic Invertebrates* section.

The miles of water quality impaired priority reaches open and closed to salable mineral development areas are displayed in Table 4-72. The risk for impacts to water quality would be increased in RCAs that are Priority 1 and 2 and restoration reaches that are open to salable mineral development.

Miles of perennial stream and HC conservation and restoration reaches in areas open and closed to salable mineral development are summarized in the *Special Status Fish and Aquatic Invertebrates* section.

Table 4-72. Water Quality Impaired Priority Reaches Open and Closed to Salable Mineral Development by Alternative (Miles)

PFC Priority Rating	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Open to Salable Mineral Development							
Priority 1 and 2	68	77	68	59	61	59	68
Priority 3	22	29	22	19	19	19	22
Total	**90**	**106**	**90**	**78**	**80**	**78**	**80**
Closed to Salable Mineral Development							
Priority 1 and 2	22	14	22	32	30	32	22
Priority 3	12	5	12	15	15	15	12
Total	**34**	**19**	**34**	**47**	**45**	**47**	**34**

[A] The No Action Alternative identifies acres open to salable mineral development, but not specific locations.

Most locatable mineral development in the planning area has historically occurred in RCAs (e.g., jasper and gold claims); locatable mineral development in RCAs can result in disturbances to the streambed, streambank, streamflow, streamside vegetation, and other RCA components (Nelson et al., 1991). Water quality can be affected as a result of chemicals used in the mineral extraction process. Recreational panning and placer mining for gold occurs in the planning area and can locally degrade water quality and riparian condition. Suction dredging is a method of mineral extraction whereby streambed particles are pulled from the stream to be sifted onshore. This activity can be disruptive to the channel bottom and result in increased sedimentation, turbidity, and long-term instability of the channel, causing short- and long-term effects to water quality. The miles of water quality impaired priority reaches withdrawn and recommended for withdrawal from locatable mineral entry are displayed in Table 4-73. Water quality impaired Priority 1 and 2 reaches and restoration reaches in areas withdrawn or recommended for withdrawal from locatable mineral entry are at least risk for impacts from locatable mineral development than areas open to locatable mineral exploration and development.

The miles of perennial stream and HC conservation and restoration reaches in areas recommended for withdrawal are displayed in the *Special Status Fish and Aquatic Invertebrates* section.

Table 4-73. Water Quality Impaired Priority Reaches Withdrawn by Statute or Recommended for Withdrawal from Locatable Mineral Entry by Alternative (Miles)

PFC Priority Rating	Alternative					
	I	II	III	IV	V	VI
Recommended for Withdrawal						
Priority 1 and 2	11	9	9	9	11	0
Priority 3	13	13	13	13	13	0
Withdrawn by Statute						
Priority 1	13	13	13	13	13	13
Total	**37**	**35**	**35**	**35**	**37**	**13**

[A] The No Action Alternative has 13 miles of water quality impaired Priority 1 Reach withdrawn from locatable mineral development by statute.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative allows mineral leasing in riparian areas, but with a no surface occupancy stipulation within 500 feet of the riparian area; however, there are currently no active mineral leases. The acreage on which salable minerals occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. No salable mineral material sources were developed under the No Action Alternative that affected riparian areas, wetlands, or water quality impaired streams. The allocation for locatable minerals recommends the Bruneau-Jarbidge and Sand Point Areas of Critical Environmental Concern; Wilderness; and the Bruneau, Jarbidge, and Salmon Falls Creek Canyon to be withdrawn from mineral entry. This would reduce the potential for impacts to PFC and HC ratings, and water quality, from locatable mineral development in these areas.

Leasable, salable, and locatable minerals exploration and development projects have the potential to reduce PFC and HC ratings, which would also reduce water quality. According to the Reasonably Foreseeable Development Scenario (RFDS) for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. Similarly, according to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur in the planning area as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing. The demand for locatable minerals in the planning area is not expected to change from present levels, which are low. Salable mineral development is expected to occur on approximately 0.2% of the area available for salable mineral development. Based on this information, the potential for leasable, salable and locatable minerals exploration and development to impact water quality is low.

Impacts from Management Common to All Action Alternatives

All action alternatives allow for leasable, salable, and locatable mineral development with stipulations to protect biological and cultural resources. Leasable, salable, and locatable mineral developments would comply with the goals and objectives for riparian areas and wetlands which would minimize the potential to reduce PFC and HC ratings and water quality. The conservation and restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D, Tables D-3, D-4, and D-5) provides direction for conserving high quality habitats and restoring impaired habitats so that PFC and HC ratings are maintained or improved. This direction would also maintain or improve water quality and support the attainment of state water quality standards.

Where mineral development might occur, use restrictions for leasable, salable, and locatable mineral development are expected to reduce the potential for effects to PFC and HC ratings and water quality from surface-disturbing activities or occupancy in RCAs. No Surface Occupancy restrictions for RCAs would avoid direct impacts to riparian areas and wetlands and water quality.

For all action alternatives, the areas closed to locatable mineral development by statute encompass 84 miles of perennial stream. Within these miles, all alternatives contain 13 miles of water quality impaired PFC rated Priority 1 stream. Water quality is not expected to be impacted by locatable mineral development in areas closed to locatable mineral development by statute.

Impacts from Management Specific to Alternative I

Within expected oil and gas areas, there would be 58 miles of perennial streams in areas open and 34 miles in areas closed to oil and gas leasing. Expected oil and gas areas open to leasing contain 29 miles of water quality impaired streams, of which 18 miles are Priority 1 and 2 reaches. The impact to water quality within expected oil and gas areas is expected to be low, as only 90 acres of surface disturbance from oil and gas exploration and leasing activities are expected, based on the oil and gas potential (Appendix K). The controlled surface use restriction for RCAs would require surface use to be consistent with goals and objectives for riparian areas and wetlands for maintaining and improving water quality. Alternative I would have the fourth most miles of water quality impaired Priority 1 and 2 reaches in expected oil and gas areas open to leasing; fewer than for Alternatives II, III, and VI, but more than for Alternatives IV and V. Alternative I would have seven miles of water quality impaired Priority 1 and 2 reaches in areas closed to oil and gas development, which is less than for Alternatives IV and V but more than the other alternatives. Areas closed oil and gas exploration and development are the most likely to promote attaining or moving toward water quality objectives.

Areas with the expected potential for geothermal development areas would include all 316 miles of perennial streams in the planning area; 133 miles would be in areas open to leasing, with 184 miles in areas closed to leasing. Areas open to geothermal leasing contain 67 miles of water quality impaired Priority 1 and 2 reaches and 21 miles of water quality impaired Priority 3 reaches. Areas closed to leasing contain 24 miles of water quality impaired Priority 1 and 2 reaches and 13 miles of water quality impaired Priority 3 reaches. The kinds of impacts of geothermal exploration and development in RCAs are similar to those described for oil and gas, except 185 to 230 acres of surface disturbance are expected for

geothermal activities based on geothermal resource potential (Appendix L). Alternative I would have fewer miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas than Alternatives II, III, and VI but more than Alternatives IV and V. Areas closed to geothermal exploration and development are the most likely to attain or move toward water quality objectives relative to geothermal development.

Alternative I would have 138 miles of perennial streams in areas open and 180 miles in areas closed to salable mineral development. Areas open to salable mineral development contain 90 miles of water quality impaired PFC rated streams; 68 miles are water quality impaired Priority 1 and 2 streams. Alternative I would have the same miles of Priority 1 and 2 reaches recommended for withdrawal from salable mineral development as Alternatives III and VI, which is less than Alternative II but more than for the other alternatives. Salable mineral developments would comply with goals and objectives for riparian areas and wetlands to maintain or improve PFC and HC ratings, which would reduce the potential impacts to water quality. Salable mineral development would have minor, if any, impacts to water quality. Water quality in areas closed to salable mineral development would not be impacted by this use.

This alternative would have 132 miles of perennial streams in areas available for locatable mineral development and 100 miles of perennial stream recommended for withdrawal from locatable mineral development. Areas recommended to be withdrawn include 11 miles of water quality impaired Priority 1 and 2 reaches. Locatable mineral projects would pose an increased risk for a reduction in water quality where these activities occur in RCAs. Locatable mineral developments would be consistent with goals and objectives for riparian areas and wetlands which would reduce the potential for impacts to water quality to the extent possible. Demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to water quality are low. In relation to miles of perennial streams, Alternative I would have the fewest miles available for locatable mineral development of all alternatives and would pose the least risk for impacts to water quality. Alternative I, similar to Alternative V, would have the most miles of water quality impaired Priority 1 and 2 reaches recommended for withdrawal from locatable mineral development of the alternatives. These reaches would be at a greater risk for impacts to water quality than the reaches in areas closed to locatable mineral development by statute. They would be at less risk for impacts to water quality than the reaches in areas open to locatable mineral development.

Impacts from Management Specific to Alternative II

Expected oil and gas areas would have 91 miles of perennial streams in areas open and 1 mile in areas closed to oil and gas leasing. Expected oil and gas areas open to leasing contain 48 miles of water quality impaired streams, of which 25 miles are Priority 1 and 2 reaches. The expected low amount of surface disturbance from oil and gas exploration and leasing activities (Appendix K) is the same as described for Alternative I. Alternative II would have the most miles of water quality impaired Priority 1 and 2 reaches open to oil and gas leasing of all alternatives and would pose the greatest risk for impacts to water quality in these open areas.

Areas with the expected potential for geothermal development would include all 316 miles of perennial streams in the planning area; 214 miles would be in areas open to leasing, with 103 miles in areas closed to leasing. Areas open to leasing contain 78 miles of water quality impaired Priority 1 and 2 reaches and 35 miles of water quality impaired Priority 3 reaches. Areas closed to leasing contain 13 miles of water quality impaired Priority 1 and 2 reaches and no water quality impaired Priority 3 reaches. The types of impacts of geothermal exploration and development on water quality are similar to those described for Alternative I. This alternative would have the most miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas of all alternatives and therefore would have the most risk to water quality.

There would be 203 miles of perennial streams in areas open and 114 miles in areas closed to salable mineral development. Areas open to salable mineral development contain 106 miles of water quality impaired PFC rated stream; 77 miles are water quality impaired Priority 1 and 2 reaches. This alternative would have the most water quality impaired Priority 1 and 2 reaches in areas open to salable mineral development of any of the action alternatives. The acreage on which salable mineral development occurs

is expected to increase from approximately 1,300 acres to approximately 3,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Salable mineral developments would comply with goals and objectives for riparian areas and wetlands to maintain or improve PFC and HC ratings, which would reduce the potential impacts to water quality. Salable mineral development under this management direction would have minor, if any, impacts to water quality impaired streams.

There would be 144 miles of perennial streams available for locatable mineral development and 87 miles of perennial streams in areas recommended for withdrawal from locatable mineral development. Areas recommended to be withdrawn include nine miles of water quality impaired Priority 1 and 2 reaches. The effects of locatable minerals development on water quality are similar to but slightly more than Alternative I. Alternative II would have the second most miles of perennial stream in areas available for locatable mineral development; the same as Alternative III, less than Alternative VI, but more than the other alternatives. Alternative II would have the second most miles of water quality impaired Priority 1 and 2 reaches in areas recommended for withdrawal from locatable mineral development; the same as for Alternatives III and IV, less than Alternatives I and V, but more than Alternative VI. These reaches would be at a greater risk for impacts to water quality due to locatable mineral development than the reaches in areas closed to development by statute. They would be at less risk for impacts to water quality than the reaches in areas open to locatable mineral development.

Impacts from Management Specific to Alternative III

Expected oil and gas areas would have 64 miles of perennial streams in areas open and 28 mile in areas closed to oil and gas leasing. There would be 33 miles of water quality impaired streams in areas open for oil and gas leasing, of which 21 miles are Priority 1 and 2 reaches. The expected low amount of surface disturbance from oil and gas exploration and leasing activities (Appendix K) is the same as described for Alternative I, except more miles of water quality impaired Priority 1 and 2 reaches would be available to oil and gas exploration and development. This alternative, similar to Alternative VI, would have the second most miles of water quality impaired Priority 1 and 2 reach areas open to oil and gas and the second most risk for impacts to water quality; less than for Alternative II but more than the other alternatives.

Areas with the expected potential for geothermal development would include all 316 miles of perennial streams; 146 miles would be in areas open to leasing, with 171 miles in areas closed to leasing. Areas open to leasing contain 69 miles of water quality impaired Priority 1 and 2 reaches and 22 miles of water quality impaired Priority 3 reaches. Areas closed to leasing contain 22 miles of water quality impaired Priority 1 and 2 reaches and 13 miles of water quality impaired Priority 3 reaches. The types of impacts of geothermal exploration and development on water quality are similar to those described for Alternative I. Alternative III would have fewer miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas than Alternative II, which is the most miles of all action alternatives; it would have the second most risks to water quality of the alternatives.

There would be 144 miles of perennial streams in areas open and 154 miles in areas closed to salable mineral development. Areas open to salable mineral development and the miles of water quality impaired PFC rated stream are the same as for Alternatives I and VI. The impacts would be the same as for Alternatives I and VI, which is more than for Alternatives IV and V but less than for Alternative II.

This alternative would have the same perennial stream miles available and miles recommended for withdrawal from locatable mineral development as Alternative II. It would have the same miles of Priority 1 and 2 reaches in areas recommended withdrawn from locatable mineral development as Alternatives II and IV. The impacts to water quality are similar to Alternative II.

Impacts from Management Specific to Alternative IV

Expected oil and gas areas would have 54 miles of perennial streams in areas open and 38 miles in areas closed to oil and gas leasing. Expected oil and gas areas open to leasing contain 23 miles of water quality impaired streams open to oil and gas leasing, of which 14 miles are Priority 1 and 2 reaches. The expected low amount of surface disturbance from oil and gas exploration and leasing activities (Appendix

K) is the same as described for Alternative I, but the area open to development is smaller. Alternative IV would have the second fewest miles of water quality impaired Priority 1 and 2 reaches open to leasing; more than Alternative V but less than the other alternatives. Alternative IV would have the second lowest risk for impacts to water quality in Priority 1 and 2 reaches of all alternatives.

In areas with the expected potential for geothermal development, there is a slight variation in the open and closed acres for Alternatives IV-A and IV-B. Alternative IV-A has 124 miles of perennial streams in areas open and 193 miles in areas closed to leasing, while Alternative IV-B has 126 miles in areas open and 191 miles in areas closed to leasing. Areas open to leasing in Alternatives IV-A and IV-B contain 60 and 62 miles of water quality impaired Priority 1 and 2 reaches, respectively, and 20 miles of water quality impaired Priority 3 reaches. Areas closed to leasing contain 31 and 29 miles of water quality impaired Priority 1 and 2 reaches, for Alternatives IV-A and IV-B respectively, and 15 miles of water quality impaired Priority 3 reaches. The types of impacts of geothermal exploration and development on water quality are similar to those described for Alternative I. Alternative IV-A would have the fewest miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas; more than Alternative V but less than the other alternatives. Alternative IV-B would have the third fewest miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas. The risk for impacts to water quality in expected geothermal development areas for Alternatives IV-A and IV-B are similar to Alternative V; the risks to water quality impaired Priority 1 and 2 reaches streams for these three alternatives only vary by one mile.

Alternative IV-A would have 123 miles of perennial streams in areas open and 194 miles in areas closed to salable mineral development. Alternative IV-B would have 125 miles of perennial streams in areas open and 192 miles in areas closed to salable mineral development. In Alternatives IV-A and IV-B, areas open to salable mineral development contain 59 and 61 miles of water quality impaired Priority 1 and 2 reaches, respectively. Alternative IV-A, similar to Alternative V, has the fewest miles of water quality impaired Priority 1 and 2 reaches in areas open for salable mineral development; two fewer miles than would be available for Alternative IV-B. The impacts of salable minerals on water quality would be the similar to those described for Alternative I, expect there would be less risk for impacts to water quality in Alternative IV.

Alternative IV would have 135 miles of perennial streams available for locatable mineral development and 97 miles of perennial streams in areas recommended for withdrawal from locatable mineral development. Areas recommended to be withdrawn from locatable mineral development are the same as described for Alternative II. The effects to water quality impaired Priority 1 and 2 reaches are the same as for Alternatives II and III; more than Alternative V but less than Alternative VI.

Impacts from Management Specific to Alternative V

Expected oil and gas areas would have 43 miles of perennial streams in areas open and 49 miles in areas closed to oil and gas leasing. Expected oil and gas areas open to leasing contain 20 miles of water quality impaired streams, of which 11 miles are Priority 1 and 2 reaches. The expected low amount of surface disturbance from oil and gas exploration and leasing activities (Appendix K) is the same as described for Alternative I, except fewer miles of water quality impaired stream would be in areas open to oil and gas leasing. This alternative would have the fewest miles of water quality impaired Priority 1 and 2 reaches in expected oil and gas areas open to leasing of all alternatives and therefore would have the lowest risk to water quality of all alternatives.

In areas with the expected potential for geothermal development, there would be 123 miles of perennial streams in areas open to geothermal leasing and 194 miles in areas closed to geothermal leasing. Areas open to leasing contain 61 miles of water quality impaired Priority 1 and 2 reaches and 19 miles of water quality impaired Priority 3 reaches. Areas closed to leasing contain 31 miles of water quality impaired Priority 1 and 2 reaches and 15 miles of water quality impaired Priority 3 reaches. The types of impacts of geothermal exploration and development on water quality are similar to those described for Alternative I. This alternative would have the second fewest miles of water quality impaired Priority 1 reaches in expected geothermal development areas; more than Alternative IV-A but less than the other alternatives.

Alternative V is the second most likely to attain water quality objectives in expected geothermal development areas of all alternatives.

This alternative would include 122 miles of perennial streams in areas open and 192 miles in areas closed to salable mineral development. Miles of water quality impaired Priority 1 and 2 reaches in areas open and closed to salable mineral development are the same as in Alternative IV-A; therefore, the effects of salable minerals development on water quality are the same as described for Alternative IV-A.

This alternative would have 139 miles of perennial streams in areas open to locatable mineral development and 93 miles of perennial stream in areas recommended for withdrawal from locatable mineral development; 84 miles of perennial stream are withdrawn from locatable mineral development by statute. Alternative V would have the same miles of Priority 1 and 2 reaches recommended for withdrawal for locatable mineral development as Alternative I. Therefore, impacts to water quality would be the same as Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Expected oil and gas areas would have 28 miles of perennial streams in areas open and 64 miles in areas closed to oil and gas leasing. The miles of water quality impaired stream and Priority 1 and 2 reaches in areas open for oil and gas leasing are the same as for Alternative III. The expected low amount of surface disturbance from oil and gas exploration and leasing activities (Appendix K) is the same as described for Alternative I, except fewer miles of water quality impaired stream would be in areas open to oil and gas leasing in Alternative VI. Alternative VI, along with Alternative III, would have the second highest miles of water quality impaired Priority 1 and 2 reaches open to leasing. It would have the second highest risk for impacts to water quality in expected oil and gas areas; less than Alternative II but more than the other alternatives.

In areas with the expected potential for geothermal development, there would be 139 miles of perennial streams in areas open to geothermal leasing and 178 miles in areas closed to geothermal leasing. Areas open to leasing contain 68 miles of water quality impaired Priority 1 and 2 reaches and 22 miles of water quality impaired Priority 3 reaches. Areas closed to leasing contain 22 miles of water quality impaired Priority 1 and 2 reaches and 13 miles of water quality impaired Priority 3 reaches. The types of impacts of geothermal exploration and development on water quality are similar to those described for Alternative I, except Alternative VI would have two more miles of water quality impaired stream in expected geothermal development areas. Alternative VI would have the third most miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas; less than Alternatives II and III but more than the other alternatives.

This alternative would include 138 miles of perennial streams in areas open and 180 miles in areas closed to salable mineral development. Miles of water quality impaired Priority 1 and 2 reaches in areas open and closed to salable mineral development are the same as in Alternatives I and III; therefore, the effects of salable minerals development on water quality are the same as described for Alternative I.

This alternative would have 232 miles of perennial streams in areas open to locatable mineral development and 84 miles of perennial stream in areas withdrawn from locatable mineral development by statute. There are no areas recommended for withdrawal from locatable mineral development, which is the least of all alternatives. This alternative poses the greatest risk for locatable mineral development to impact water quality of all alternatives.

Impacts from Areas of Critical Environmental Concern Actions

The management actions for each Area of Critical Environmental Concern (ACEC) are designed to maintain or improve relevant and important values by not allowing, modifying, or eliminating activities that would impair these values. Modifications to motorized access, infrastructure, wildland fire suppression, mineral withdrawal, livestock grazing, and restoration treatments would support or maintain relevant and important values for the ACECs, but only some actions would improve water quality. The most improvement in water quality would be expected to occur in areas where these activities are contributing to the water quality impairment. Except for the Inside Desert in Alternative IV-B, all of the nominated

ACECs contain surface water resources. ACEC designations are likely to improve proper functioning condition (PFC) and habitat condition (HC) ratings, which would also maintain or improve water quality within the ACEC. The ACECs which contain Riparian Conservation Areas (RCAs) within Wilderness or Wild and Scenic River (WSR) designations would improve and be maintained in a fully functioning condition according to Wilderness or WSR management.

The following indicator was used to analyze the impacts of Areas of Critical Environmental Concern actions on water resources:

- Water quality in water quality impaired streams within ACEC designations (in PFC Priority 1 and 2 reaches).

The miles of water quality impaired streams in ACECs are displayed in Table 4-74; water quality impaired priority reaches in ACECs are displayed in Table 4-75. Miles of perennial stream and HC conservation and restoration reaches in ACECs are displayed in the *Special Status Fish and Aquatic Invertebrates* section.

Table 4-74. Water Quality Impaired Streams by Area of Critical Environmental Concern by Alternative (Miles)

ACEC[A]	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Bruneau-Jarbidge	26	26	NA	13	34	34	NA	NA
Inside Desert	NA	NA	NA	NA	2	0	NA	NA
Jarbidge Foothills	NA	NA	NA	NA	141	95	NA	NA
Lower Bruneau Canyon	NA	0	NA	NA	0	0	0	0
Middle Snake	NA	9	NA	NA	NA	NA	9	NA
Sagebrush Sea	NA	NA	NA	NA	NA	NA	333	NA
Salmon Falls Creek	32	32	NA	32	NA	NA	NA	32
Sand Point	1	2	NA	2	2	2	2	2
Upper Bruneau Canyon	NA	NA	NA	NA	NA	NA	NA	1
Total Water Quality Impaired Stream Miles	**59**	**70**	NA	**47**	**179**	**131**	**344**	**35**

[A] NA indicates the ACEC would not be designated in that alternative.

Table 4-75. Water Quality Impaired Priority Reaches in Areas of Critical Environmental Concern by Alternative (Miles)

PFC Priority Rating [A]	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Priority 1 and 2	13	17	0	4	50	31	90	0
Priority 3	5	11	0	2	20	12	31	2
Total	**18**	**28**	**0**	**6**	**70**	**43**	**121**	**2**

[A] Riparian areas in the Lower Bruneau Canyon and Sand Point ACECs do not have PFC data and therefore do not have priority ratings.

Impacts from Management Specific to the No Action Alternative

The Bruneau-Jarbidge, Salmon Falls Creek, and Sand Point ACECs include approximately 142 miles of perennial streams. The ACECs encompass 59 miles of water quality impaired streams. These ACECs contain 18 miles of water quality impaired priority reaches, of which 13 miles are Priority 1 and 2 reaches and 5 miles are Priority 3 reaches.

A portion of the impacts to water quality on the BLM-managed stream reaches are the result of impacts to water quality upstream from public land that are beyond BLM control (i.e., alterations in streamflow). The impacts to water quality that have occurred in these ACECs include impacts related to recreational uses

and an increased incidence of noxious weeds and invasive plants in RCAs. Two of the three ACECs receive a limited amount of human use due to the steep canyon walls that limit access. The source of water quality impairment for these ACEC is most likely from upstream uses (i.e., road maintenance, reduced riparian vegetation condition, consumptive and non-consumptive water uses). The No Action Alternative is expected to maintain or slightly improve water quality due to BLM management actions within the designated ACECs. It is recognized that impacts to water quality may continue to occur due to influences outside of the ACEC and beyond BLM control.

Impacts from Management Specific to Alternative I

This alternative would designate five ACECs including 157 miles of perennial streams. The ACECs encompass 70 miles of water quality impaired streams. These ACECs contain 28 miles of water quality impaired priority reaches, of which 17 miles are Priority 1 and 2 reaches and 11 miles are Priority 3 reaches. The designation of these ACECs would facilitate water quality impaired streams achieving or moving toward State water quality standards. Alternative I would have more miles of water quality impaired streams within ACECs moving toward or attaining State water quality standards than No Action Alternative and Alternatives II, III, and VI but less than Alternatives IV and V because more reaches are included within ACECs.

Impacts from Management Specific to Alternative II

No ACECs would be designated under Alternative II. In some locations, riparian areas and water quality would be maintained or improved by Wilderness Study Area (WSA) management or WSR management. In areas not encompassed by WSA or WSR management, the management direction for aquatic resources nevertheless is expected to reduce the potential for impacts to PFC and HC ratings, which would reduce impacts to water quality. The stream reaches most at risk for impacts to water quality would be water quality impaired Priority 1 and 2 reaches and HC restoration reaches because one or more water quality indicators are already impaired (Appendix D, Tables D-3, D-4, and D-5). Not designating ACECs would likely result in a slower rate of achieving water quality objectives than if ACECs were designated to reduce impacts from land uses to improve relevant and important values.

Impacts from Management Specific to Alternative III

Alternative III would designate three ACECs including 85 miles of perennial streams, all of which are either eligible or suitable WSR corridors. The ACECs encompass 47 miles of water quality impaired streams. Of these miles, six miles of water quality impaired priority reaches, four miles are Priority 1 or 2 reaches, and two miles are Priority 3 reaches. Designating these ACECs would improve PFC and HC ratings, which would facilitate water quality impaired streams achieving or moving toward State water quality standards. Alternative III would have more miles of water quality impaired stream within ACEC designations than Alternatives II and VI but less than the other alternatives. The eligible and suitable WSR designations would ensure that water quality in impaired and non-impaired streams would be improved or maintained with the ACECs.

Impacts from Management Specific to Alternative IV

Alternative IV would designate five ACECs. Alternative IV-A would include 196 miles of perennial streams, and Alternative IV- B would include 162 miles. There are 179 miles and 131 miles of water quality impaired streams for Alternatives IV-A and IV-B, respectively. There are 70 miles and 43 miles of water quality impaired priority reaches in ACECs for Alternatives IV-A and IV-B, respectively. These ACECs include 50 miles in Alternative IV-A and 31 miles in Alternative IV-B of water quality impaired Priority 1 and 2 reaches. Alternative IV would result in more improvement in PFC and HC ratings, which would result in more miles of water quality impaired streams moving toward or achieving State water quality standards than the No Action Alternative and Alternatives I, II, III, and VI. Active restoration actions would reduce water quality in the short term but would improve it in the long term. This would facilitate water quality impaired streams achieving or moving toward State water quality standards faster than in the No Action Alternative and Alternatives I, II, III, and VI.

Impacts from Management Specific to Alternative V

This alternative would designate four ACECs including 276 miles of perennial streams. The ACECs encompass 344 miles of water quality impaired streams, which is the most of all alternatives. These

ACECs include 121 miles of water quality impaired priority reaches; 90 miles are Priority 1 and 2 reaches and 31 miles are Priority 3 reaches. This alternative would have the most miles of water quality impaired streams under ACEC management moving toward or achieving State water quality standards of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate four ACECs including 49 miles of perennial streams, all of which are either eligible or suitable WSR. The ACECs encompass 35 miles of water quality impaired streams which is the least of all alternatives which include ACEC designations. These ACECs encompass two miles of water quality impaired priority reaches, all of which are in Priority 3 reaches. This alternative would have the fewest miles of water quality impaired streams within designated ACECs of all alternatives which include ACEC designations. However, the management for eligible and suitable WSRs would ensure water quality within the ACECs achieves State water quality standards. Management of these ACECs would facilitate water quality impaired and non-water quality impaired streams achieving State water quality standards. Alternative VI has the second least miles of water quality impaired streams and Priority 1 and 2 reaches under ACEC management of all alternatives; more than for Alternative II but less than the other alternatives.

Impacts from Wild and Scenic Rivers Actions

The management of Wild and Scenic Rivers (WSRs) includes direction to maintain or enhance outstanding remarkable values, free-flowing condition, water quality, and tentative classification. These qualifying values are to be maintained or enhanced in eligible and suitable river segments.

The following indicator was used to analyze the impacts of Wild and Scenic River actions on water resources:

- Water quality in water quality impaired streams (in proper functioning condition [PFC] Priority 1 and 2 reaches within eligible and suitable WSR corridors).

Table 4-76. Eligible and Suitable Wild and Scenic River Segments that are Water Quality Impaired or have Water Quality Impaired Tributaries (Miles)

Wild and Scenic River Segment	PFC Priority Rating	Miles of Water Quality Impaired Priority Streams
Snake River [A]	Priority 1 and 2	2
	Priority 3	9
Jarbidge River, East Fork	Priority 1 and 2	0
	Priority 3	4
Jarbidge River	Priority 1 and 2	5
	Priority 3	0
Rocky Canyon	Priority 1 and 2	2
	Priority 3	0
Salmon Falls Creek, (Lower)	Priority 1 and 2	0
	Priority 3	0
Total		**23**

[A] Two miles of water quality impaired streams in the Three Island Reach of the Snake River do not have PFC data.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The objectives for managing eligible and suitable WSRs in the No Action Alternative and all action alternatives are to maintain or enhance the outstanding remarkable values, free-flowing condition, water quality, and to protect the scenic and recreational values of the Bruneau and Jarbidge Rivers through special designation and management. Managing the Bruneau and Jarbidge Rivers as components of the National Wild and Scenic River System would ensure that activities within these river segments would maintain water quality values. Water quality could be impacted by management actions upstream of the WSR river segments; there are 23 miles of water quality impaired streams within WSR segments, of

which 9 miles are Priority 1 and 2 reaches and 14 miles are Priority 3 reaches. Water resource values are expected to be maintained or enhanced under WSR management direction in the No Action Alternative and all action alternatives and would achieve state water quality standards.

Summary of Direct and Indirect Impacts

The impact analysis focused on resource uses and activities that are most likely to affect water quality and water quality impaired streams. Allocations making areas available for uses and activities that affect water quality include the following: Wildland fire in critical and conditional suppression areas, areas open and closed to livestock grazing, recreation within a Special Recreation Management Area (SRMA), travel designations (areas closed, limited and open to cross-country motorized vehicle use), areas open to right-of-way (ROW) and expected wind energy development, areas open or closed to mineral exploration and development, and areas affected by management of Areas of Critical Environmental Concern (ACEC). The more miles of water quality impaired Priority 1 and 2 reaches in areas open to resource uses, the greater the risk for reduction in proper functioning condition (PFC) rating and water quality. The miles of water quality impaired Priority 1 and 2 reaches impacted by land use authorizations are displayed in Table 4-77.

Table 4-77. Summary of Impacts to Water Quality Impaired Proper Functioning Condition Rated Streams by Alternative (Miles)

Indicator [A]	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Wildland Fire Ecology and Management								
Improve	125	59	33	49	87	68	125	50
Maintain	NA[B]	66	91	75	37	56	0	76
Livestock Grazing								
Improve	27	53	38	38	553	52	84	49
Maintain	99	72	86	86	73	74	41	75
Riparian Reference Areas								
Improve	ND[C]	19	7	7	19		25	19
Recreation (SRMAs)								
Improve	ND[C]	59	2	2	13		1	59
Maintain	ND[C]	66	123	123	112		124	66
Transportation and Travel								
Improve	13	17	13	13	23		26	13
Maintain	113	109	112	113	103		98	112
Land Use Authorizations								
ROWs								
Improve [D]	38	38	38	38	29		4	4
Maintain [D]	6	6	6	6	96		121	121
Expected Wind Energy Development								
Improve	107	124	95	121	124		124	122
Maintain	18	1	30	4	1		1	3
Minerals								
Expected Oil and Gas Leasing								
Improve	NA[B]	19	0	16	25		29	16
Maintain	ND[C]	29	48	33	23		20	33
Expected Geothermal Leasing								
Improve	NA[B]	37	13	35	46	44	46	35
Maintain	NA[B]	88	113	91	80	82	80	90
Salable Minerals								
Improve	ND[C]	34	19	34	47	45	47	34
Maintain	ND[C]	90	106	90	78	80	78	80

Indicator [A]	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Minerals								
Locatable Minerals								
Improve	NA[B]	37	35	35	35		37	13
Maintain	NA[B]	88	90	90	90		88	112
Areas of Critical Environmental Concern								
Improve	18	28	0	6	70	43	121	2
Maintain	107	97	125	119	55	82	4	123

[A] The indicators for the table are displayed as predicted to improve or maintain water quality for the 125 miles of water quality impaired PFC rated streams, which are the most likely to be impacted by the management actions in Chapter 2. Numbers may vary slightly due to rounding.
[B] The land allocation does not apply.
[C] No data/data not available.
[D] ROW avoidance and ROW exclusion areas may overlap.

Compliance with the State water quality standards would apply to all alternatives and, as a result, management is expected to reduce impacts to water quality. The rate of improvement in PFC ratings for water quality impaired streams is dependent on the riparian areas and wetlands objectives for each of the alternatives (see Chapter 2, *Riparian Areas and Wetlands* section for each alternative). Improving PFC ratings to be moving toward or attaining PFC would improve water quality in water quality impaired streams and promote the attainment of State water quality standards over the long term.

Impacts from the No Action Alternative

The No Action Alternative is expected to have the highest risk to water quality and have the longest recovery time of degraded watershed conditions of all action alternatives because it does not include specific management direction or actions to restore riparian areas or improve water quality as is provided in the action alternatives. Water resources would continue to be protected through the use of existing policies and regulations. Fewer miles of water quality impaired stream would move toward the achievement of State water quality standards. The No Action Alternative is expected to maintain current water quality conditions and result in the fewest miles of water quality impaired stream meeting State water quality standards over the life of the plan.

Overall, the No Action Alternative would result in minor localized but adverse short-term impacts to water quality, but is expected to maintain the existing water quality conditions in the long term.

Impacts from Alternative I

Alternative I would maintain 85 miles of stream at PFC, achieve 60 miles of PFC, and have 80 miles of stream moving toward PFC over the life of the plan. The result of this management is all 182 miles of water quality impaired perennial streams are expected improve water quality commensurate with the rate and level of improvement in riparian condition. Alternative I is more likely to attain State water quality standards and riparian objectives over the life of the plan than the No Action Alternative and Alternative II, but less likely than Alternatives III, IV, V, and VI.

Alternative I is expected to result in fewer impacts to water quality than Alternatives II, III, and VI but more than Alternatives IV and V with regard to wildland fire management. This alternative would have more miles of water quality impaired streams not at PFC within areas available to grazing than Alternative V, the same as Alternative VI, but less than the other alternatives. Alternative I, the same as for Alternative VI, would have the most miles of water quality impaired stream not at PFC included within SRMAs which would improve water quality and PFC ratings related to recreation impacts. Alternative I has more miles of Priority 1 and 2 reaches with impaired water quality in areas with limited travel designations than the No Action Alternative and Alternatives IV and V and the same miles as Alternatives II, III, and VI. This alternative would have the fourth most miles of water quality impaired Priority 1 and 2 reaches in expected oil and gas areas open to leasing. Alternative I would have fewer miles of Priority 1 and 2 reaches in expected geothermal development areas than the No Action Alternative and Alternatives II, III,

and VI. ACEC management direction for Alternative I is expected to result in the fourth most miles of improvement riparian condition and water quality of all alternatives.

Overall, Alternative I would result in minor to moderate localized short-term adverse impacts to water quality, but is expected to result in maintaining or minor but extensive improvement in water quality conditions in the long term.

Impacts from Alternative II

Alternative II would maintain 85 miles of stream at PFC and have 140 miles of stream moving toward PFC over the life of the plan. The result of this management is all 182 miles of water quality impaired perennial streams are expected to improve in water quality commensurate with the rate and level of improvement in riparian condition. Alternative II is more likely to attain State water quality standards over the life of the plan than the No Action Alternative, but less likely than Alternatives I, III, IV, V, and VI.

Alternative II would have the most miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas of all alternatives and is expected to result in the most risk for impacts to water quality with regard to wildland fire management. Vegetation Management Area (VMA) A would be the first priority for wildland fire suppression which has the least amount of water quality impaired stream of all four VMAs. In Alternative II, there would be substantially more livestock grazing animal unit months than any other alternative; it would pose the second greatest risk for impacts to water quality due to livestock grazing relative to the No Action Alternative. Alternative II has the same miles of Priority 1 and 2 reaches with impaired water quality in areas with limited travel designations as Alternatives I, III, and VI and more than Alternatives IV and V. Alternative II would have the most miles of water quality impaired Priority 1 and 2 reaches in expected oil and gas and geothermal development areas of all alternatives and would pose the greatest risk for impacts to water quality relative to these uses. Not designating ACECs would likely result in a slower rate of achieving water quality objectives than if ACECs were designated.

Overall, Alternative II would result in minor to moderate localized short-term adverse impacts to water quality due to the increased authorized uses. This alternative is expected to result in maintaining or minor to moderate localized improvements in water quality conditions in the long term.

Impacts from Alternative III

Alternative III would maintain 85 miles of stream at PFC, improve 98 miles to achieve PFC, and move 42 miles of stream toward PFC over the life of the plan. The result of this management is all 182 miles of water quality impaired perennial streams are expected to improve in water quality commensurate with the rate and level of improvement in riparian condition. Alternative III would have an increased level of authorized resource use and enhanced wildland fire suppression capabilities, which would pose a localized increase in risk to riparian areas and water quality. This alternative is expected to achieve riparian objectives more slowly than Alternatives I, IV, V, and VI, but faster than the No Action Alternative and Alternative II. Alternative III is more likely to facilitate the attainment of State water quality standards and movement towards the attainment of riparian objectives over the life of the plan than the No Action Alternative and Alternatives I and II, but is less likely than Alternatives IV, V, and VI.

Alternative III is expected to result in fewer impacts to water quality than Alternatives II and VI but more than Alternatives I, IV, and V with regard to wildland fire management. Alternative III authorizes livestock grazing on the same amount of riparian area as Alternative II, but with fewer AUMs. There would be slightly fewer impacts from livestock grazing in Alternative III compared to Alternative II due to a lower percent of vegetation production allocated to livestock. Livestock grazing in Alternative III would have a greater potential for impacts to water quality than Alternatives I, IV, V, and VI, but less than for the No Action Alternative and Alternative II. This alternative has the same miles of Priority 1 and 2 reaches with impaired water quality in areas with limited travel designations as Alternatives I, II, and VI, which is more than the other alternatives. There would be an increase in the miles of roads because all routes would be maintained for wildland fire suppression and new routes would be created to enhance suppression efforts. This alternative would have the most miles of water quality impaired stream at risk for impacts due to roads. Alternative III would include more miles of priority streams in expected oil and gas development areas than Alternative I but less than Alternative II. Alternative III would have the second most miles of

Priority 1 and 2 reaches in expected geothermal development areas Alternative III would have more miles of water quality impaired stream within ACEC designations than Alternatives II and VI but less than the other alternatives.

Overall, Alternative III would result in minor to moderate localized short-term adverse impacts to water quality due to increased wildland fire infrastructure; however some areas may experience moderate but extensive beneficial impacts to existing water quality conditions in the long term as impacts due to wildland fire are reduced.

Impacts from Alternative IV

Alternative IV would have the same miles of riparian area moving toward or achieving PFC as Alternative III, resulting in the same amount of improvement in water quality over the life of the plan. Active restoration, which is emphasized in this alternative, is more likely to facilitate the achievement of State water quality standards over the life of the plan than passive restoration. Alternative IV is more likely to facilitate the movement towards or the attainment State water quality standards than all other alternatives.

Alternative IV-A would have the second fewest miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas and therefore the second least risk for impacts to water quality due to wildland fire management; less than Alternative V but more than the other alternatives. Alternative IV-B would have the third least risk for impacts to water quality due to wildland fire management. The increase in roads to improve wildland fire suppression response times is expected to result in fewer miles of riparian area and water quality impaired streams to be impacted by wildland fire. However, the increase in roads to enhance wildland fire suppression is expected to have localized, long-term impacts to water quality where the new roads occur in the Riparian Conservation Area (RCA).

Alternative IV would have more miles of water quality impaired Priority 1 and 2 reaches in areas available to livestock grazing than Alternatives I, V, and VI but fewer than the No Action Alternative and Alternatives II and III. This alternative would allocate a lower percentage of vegetation production to livestock than the No Action Alternative and Alternatives I, II, III, and VI and therefore would have fewer impacts to water quality from livestock grazing. This alternative has fewer miles of Priority 1 and 2 reaches with impaired water quality in areas with limited travel designations than the No Action Alternative and Alternatives I, II, III, and VI but slightly more than Alternative V. Alternative IV, similar to Alternative VI, emphasizes active restoration and is likely to result in more miles of road in RCAs containing water quality impaired streams to be improved or modified to reduce impacts to water quality than in the No Action Alternative and Alternatives I, II, and III. Alternative IV would have more impacts to water quality from expected oil and gas development areas than Alternative V, but less than all other alternatives. Alternative IV would have the fewest impacts to water quality impaired streams in expected geothermal development areas of all alternatives. Alternative IV would include fewer miles of water quality impaired stream within ACECs than Alternative V but more than the other the alternatives.

Overall, Alternative IV would result in minor to moderate localized adverse short-term impacts to water quality from restoration treatments which would lead to moderate to major extensive beneficial impacts and the fastest rates of recovery of water quality conditions of all alternatives in the long term.

Impacts from Alternative V

Alternative V would have the same miles of riparian area moving toward or achieving PFC as Alternative III, resulting in the same amount of improvement in water quality over the life of the plan. Passive restoration, which is emphasized in this alternative, is likely to facilitate the achievement of State water quality standards over the life of the plan but at a slower rate than is expected for alternatives emphasizing active restoration. Alternative V would have the least amount of public land uses of all alternatives which would result in improved water quality across a broader area than would be expected for Alternative IV. Alternative V has the least risk for impacts to water quality from authorized uses of all alternatives.

Alternative V is expected to result in fewer impacts to water quality than any of the other alternatives with regard to wildland fire management. Water developments would be maintained at their current levels and

no new roads would be constructed which would result in fewer disturbances to water quality impaired streams and riparian areas. The risk to water quality from wildland fire suppression would be reduced, but the risk for impacts due to wildland fire would be increased due to the limited infrastructure to enhance wildland fire suppression efforts. Alternative V includes the least amount of water quality impaired stream not at PFC in areas available to livestock grazing of all alternatives and the most miles of water quality impaired stream in riparian reference areas. The level of livestock use in Alternative V, which would be substantially less than the other alternatives, would result in the fewest impacts to water quality of any alternative. Alternative V has the fewest miles of Priority 1 and 2 reaches with impaired water quality in a SRMA and in areas designated as limited travel of all alternatives. Alternative V would have the fewest miles of Priority 1 and 2 reaches in expected oil and gas development areas and the fewest risk to water quality of all alternatives; it would have the second fewest miles of Priority 1 and 2 reaches in expected geothermal development areas. This alternative would have the most miles of water quality impaired streams under ACEC management, resulting in the fewest risk for impacts to water quality due to ACEC management.

Overall, Alternative V would result in the fewest short-term adverse impacts to water quality due to reduced authorized uses and passive restoration techniques. This alternative is expected to result in moderate to major area-wide beneficial impacts to water quality in the long term due to natural recovery after the reduction in authorized resource uses.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would have the same miles of riparian area moving toward or achieving PFC as Alternative III, resulting in the same amount of improvement in water quality over the life of the plan. Active restoration is more likely to facilitate the achievement of State water quality standards over the life of the plan than passive restoration; similar to Alternative IV. Alternative VI, along with Alternative IV, is more likely to facilitate the movement towards or the attainment State water quality standards than all other alternatives in the long term.

Alternative VI would have fewer miles of water quality impaired Priority 1 and 2 reaches in conditional suppression areas than Alternative II but more than the other alternatives. Alternative VI would have the second most risk for impacts to water quality with regard to wildland fire management. The increase in roads to improve wildland fire suppression response times is expected to result in fewer miles of water quality impaired streams being impacted by wildland fire. However, the increase in roads to enhance wildland fire suppression is expected to have localized, long-term reductions in water quality where the new roads occur in the RCA. Alternative VI would have more miles of water quality impaired streams available to livestock grazing than Alternatives I, IV, and V but less than the other alternatives. Alternative VI would have the same acres of riparian reference areas as Alternatives I and IV which is more than would occur in Alternatives II and III, and less than Alternative V. This alternative would have the same miles of Priority 1 and 2 reaches within a SRMA as Alternative I, which is the most of all alternatives. Alternative VI, along with Alternative III, would have the second highest miles of water quality impaired Priority 1 and 2 reaches in expected oil and gas development areas; it would have the second highest risk for impacts to water quality relative to this use. Alternative VI would have the third most miles of water quality impaired Priority 1 and 2 reaches in expected geothermal development areas; less than Alternatives II and III but more than the other alternatives. Alternative VI would include the fewest miles of water quality impaired stream not at PFC within ACECs of all alternatives, except for Alternative II.

Overall, Alternative VI would result in minor to moderate localized short-term adverse impacts to water quality but is expected to result in maintaining or moderate extensive beneficial impacts to water quality in the long term.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

This assessment considers the effects of past, present, and reasonably foreseeable actions on Federal, State, and private lands within and adjacent to the planning area in addition to the management in the alternatives. Management actions in the planning area would influence portions of the following three

primary watersheds: Bruneau River, Salmon Falls Creek, and Snake River. These primary watersheds include lands administered by the Bruneau, Burley, and Shoshone Field Offices; the Humboldt-Toiyabe National Forest; Hagerman Fossil Beds National Monument; and State lands. These watersheds also include private inholdings and two military withdrawal areas. Actions and activities that occur in the identified watersheds that have influenced water quality and quantity in the past or present or have the potential to influence water quality and quantity in the future were considered in this cumulative effects assessment.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect water resources:

- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Recreation,
- Transportation and Travel,
- Land Use Authorizations, and
- Minerals.

These actions are described in the *Introduction* to this chapter.

Primary factors affecting water quality are related to human uses in the analysis area. Consumptive and non-consumptive uses have occurred since the turn of the 20th century and include livestock watering, crop irrigation, hydroelectric power generation, fish hatcheries, reservoirs, and other impounded waters for recreation and private irrigation water. All of these uses have placed an increased demand on surface and groundwater resources in the analysis area. The effects of hydroelectric dams and other surface water developments are expected to continue in the future as human demands for water resources continue to increase over time.

For various reasons, riparian areas and wetlands are focus areas for many uses and have been locally degraded over time as a result. Actions in Riparian Conservation Areas (RCAs) that contributed to current designations for impaired water quality include livestock grazing, recreational uses, road construction and use, wildland fire and wildland fire suppression, increases in the amount of noxious weeds and invasive plants, and the diversion of surface water. All of these actions have reduced riparian condition over time and are expected to continue to influence water quality and riparian condition in the future. Actions on State and private land would continue to affect water quality on BLM-managed land. As human population increases over time, the demand for surface water is expected to increase.

This cumulative impacts assessment used geographic information system data from adjacent Federal and State land management offices to determine the watersheds that have the potential to influence water quality and quantity within the planning area. Hydrologic boundaries were used to identify the drainage basins that flow into or through the planning area. These boundaries were used based on the assumption that ground disturbing activities within the upper reaches of these watersheds had the potential to affect water quality and quantity in the downstream reaches, especially where those activities occur in the RCA. However, the analysis data is limited; geographic information system data is not available to assist in quantifying the type and amount of activities on private and State lands within the three primary watersheds.

Acres burned and miles of travel routes (miles of road per square mile) by land ownership were identified as activities with the most potential to influence water quality, for the three primary watersheds.

Table 4-78. Summary of Geographic Information System Acres by Ownership, Acres Burned, and Travel Route Density for the Cumulative Impacts Analysis Area

Indicator	Land Ownership (Acres)[A]				
	BLM	USFS	State [B]	Military	Private
Bruneau River Watershed (1,553,670 Acres)					
Land Ownership (acres)	1,043,678	290,365	63,867	38,358	117,402
Burned (acres)[C]	519,905	128,430	30,944	16,909	29,827
Travel Routes by Ownership (miles)	1,631	454	100	60	183
Travel Route Density [D] (road miles/square mi.)	1.4	1.3	1.2	1.7	2.3
Salmon Falls Creek Watershed (1,225,814 Acres)[E]					
Land Ownership (acres)	785,832	116,120	28,146	160	295,556
Burned (acres)[C]	245,172	27,868	8,527	13	62,028
Travel Routes by Ownership (miles)	1,228	181	44	3	462
Travel Route Density [D] (road miles/square mi.)	1.7	1.3	1.8	12	1.7
Snake River Watershed (1,631,003 Acres)[F]					
Land Ownership (acres)	977,296	136	85,092	76,877	491,602
Burned (acres)[C]	566,003	11	39,897	61,719	62,633
Travel Routes by Ownership (miles)	1,527	0	133	120	768
Travel Route Density [D] (road miles/square mi.)	1.9	0	1.8	1.2	2.5

[A] Land ownership acreages by 5th Hydrologic Unit Code include: BLM Field Offices (Bruneau, Tuscarora, Wells, Four Rivers, Burley, Shoshone, and Jarbidge); USFS (Humboldt-Toiyabe and Sawtooth National Forests); and the acres of State, Military and private land.
[B] Idaho and Nevada combined.
[C] Footprint acres burned at least once between 1987 and 2011.
[D] Travel routes include paved and unpaved roads.
[E] An additional 7,528 acres of BLM land lie within the Snake River Watershed (Historic Waters, Islands).
[F] An additional 4,310 acres of National Park Service land lie within the Snake River Watershed.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Management actions implemented under the No Action Alternative combined with actions on State and private lands, have contributed to the current condition of water quality impaired streams and riparian condition within the planning area. A portion of the impaired water quality and reduced riparian condition are due to dewatering of streams for private uses under legal water rights granted by the states of Idaho and Nevada. The occurrence and frequency of large wildland fires and wildland fire suppression activities have also increased on Federal, State, and private land in the analysis area, partially as a result of the increase in noxious weeds and invasive plants, the increase in motorized recreational use, and the open designation for travel in the planning area. Trails, primitive roads, and infrastructure from other uses such as livestock grazing, energy development, or minerals exploration or development, are expected to result in a cumulative increase in impacts to water quality. Impacts associated with resource uses under the No Action Alternative are expected to maintain the current levels of cumulative impacts to water quality over the life of the plan.

Cumulative Impacts from Alternative I

In Alternative I, management actions or authorized uses in RCAs would result in cumulative effects to water quality in addition to actions and uses that have already occurred. Restoration activities on the public land would add to these effects in the short term, but would improve water quality and riparian condition in the long term.

The development of new water sources for wildland fire suppression in addition to existing water uses on Federal, State, and private land would increase impacts to water quality and quantity where these developments are constructed in RCAs. Building new roads and creating fuels breaks on public land, in addition to similar activities on State and private land in the analysis area, would also increase disturbances to riparian areas and result in additional cumulative impacts to water quality.

Livestock grazing on public lands in the analysis area would continue to impact water quality in addition to water quality from livestock grazing on State and private land. As more restrictions are placed on livestock grazing, the level of livestock use on State and private lands would be expected to increase and pose an increased risk to water quality on State and private lands. Grazing on State or private land where fencing or topography is insufficient to contain livestock would continue to pose an increased risk for cumulative impacts to water quality on the BLM-managed lands.

Changes in travel management would limit motorized travel to designated routes and would reduce the number of new roads being pioneered into RCAs, the spread of noxious weeds, and the potential for human-caused fires. Motorized recreation displaced from the planning area may result in an increase in this activity on adjacent lands that could increase impacts to water quality within the planning area. Reduced riparian condition upstream or downstream for RCA could result in loss of protective vegetation, increased erosion, and lowing of water tables that effect achieving objectives in RCAs within the planning area. Additionally, the anticipated increase in recreational use combined with the authorization of cross-country motorized vehicle use for allotment administration and other permit, lease, or right-of-way (ROW) holders would continue to pose a risk for a cumulative increase in roads and new infestations of noxious weeds and invasive plants. Travel closures in the Bruneau-Jarbidge Rivers Wilderness would reduce cumulative travel-related impacts to water quality in the Wilderness.

Land uses, such as oil and gas development, wind energy development, and geothermal development would create new roads and infrastructure on Federal, State, and private land. These activities would increase demands on surface and groundwater for project construction, operation, and maintenance that would continue to result in additional impacts to water quality in the planning area.

The cumulative impacts from implementing the goals and objectives for aquatic resource management, as supported by the conservation and restoration priorities in the Aquatic and Riparian Management Strategy (ARMS; Appendix D; Tables D-3, D-4, and D-5), are expected to have localized minor but adverse impacts to water quality but result overall in a reduction in cumulative impacts to water quality within the cumulative impact analysis area.

Cumulative Impacts from Alternative II

In Alternative II, water quality may be maintained but would likely be locally reduced compared to the existing condition over the life of the plan. Management related to commodity uses such as livestock grazing, recreation, transportation and travel, land use authorizations, energy development, and minerals exploration would be emphasized. Where these activities occur in RCAs, in addition to the activities occurring in RCAs on Federal, State, and private land, would pose an increased risk of cumulative impacts to water quality.

Wildland fires and wildland fire suppression are expected to continue in the analysis area. Improving roads and stream crossings and building new roads are expected to increase road densities. Creating fuels breaks may help reduce fire size and severity, but may not address water quality-related concerns due to fire frequency and post-wildland fire riparian recovery. The creation of new unvegetated fuels breaks would lead to long-term disturbances that could result in additional sediment into streams and impacts water quality.

Alternative II would include fuels treatments using prescribed fire and targeted grazing in addition to a substantial increase in permitted livestock grazing. These activities would occur concurrently with other land uses in the analysis area, such as oil and gas development, wind energy development, geothermal development, existing and new range infrastructure, existing and new water developments, and ROWs. All of these actions would result in an incremental increase in impacts to water quality. Several small wind projects exist on private land in the northern portion of the planning area, and a large wind energy development project (China Mountain) is proposed in the southern portion of the planning area. These land uses are expected to continue to increase on Federal, State and private lands and have additional cumulative impacts to water quality within the cumulative impacts analysis area.

The cumulative impacts from implementing the goals and objectives for riparian and water resource management are expected to have localized but moderate impacts to water quality in addition to impacts to water quality that would occur on other Federal, State and private land. Implementing the conservation and restoration priorities in the ARMS (Appendix D; Tables D-1 and D-2) would moderate impacts from actions on public lands which would not occur on Federal, State and private land within or adjacent to the planning area. Due to the overall increase in public land uses, the cumulative impacts from implementing Alternative II are expected to be more than for the No Action Alternative and Alternative I.

Cumulative Impacts from Alternative III

In Alternative III, management actions or authorized uses in RCAs would result in cumulative effects to water quality in addition to actions and uses that have already occurred. Water quality may be maintained but would likely be locally reduced below the existing condition over the life of the plan. Management strategies most beneficial for enhancing wildland fire suppression capabilities, management of fuels, and reducing wildland fire would be emphasized and would occur concurrently with commodity uses such as livestock grazing, recreation, transportation and travel, land use authorizations, and minerals exploration. The potential increase in total animal unit months, once upland vegetation objectives are achieved, may impact a larger percentage of riparian areas containing water quality impaired streams in the planning area than for other alternatives, except Alternative II.

The cumulative effects of transportation and travel actions would be similar to Alternative II. The greatest increase in road and other infrastructure to enhance wildland fire suppression is expected to occur in Vegetation Management Area (VMA) B, which has first priority for wildland fire suppression during multiple ignitions and has the second most miles of water quality impaired streams in the planning area. These new roads would result in a cumulative increase in road density within the cumulative impacts analysis area. Response time for wildland fire suppression would be shortened as a result of these additional roads, and fewer miles of riparian area and water quality limited stream would be affected by wildland fire. These additional roads, particularly the roads within RCAs, are expected to contribute additional sediment to streams. New water developments created to enhance wildland fire suppression would occur simultaneously with the private land irrigation and livestock watering developments and would increase water demand on existing surface and groundwater resources. These increased water demands would primarily occur in VMA B, where water resources are already limited and a majority of the streams are identified as water quality impaired. The increase in recreational activities would contribute to a cumulative increase in the spread of noxious weeds and invasive plants and potentially human-caused fires over the long term. There would be fewer acres of noxious weeds treated in Alternative III than for alternatives, except Alternative VI. This would result in a cumulative increase in noxious weed and invasive plants within the cumulative impacts analysis area.

The cumulative impacts from implementing the goals and objectives for riparian and water resource management are expected to have localized moderate impacts to water quality in addition to impacts that would occur on other lands. Implementing the conservation and restoration priorities in the ARMS (Appendix D; Tables D-3, D-4 and D-5) would moderate impacts from actions on public lands which would not occur on other lands within or adjacent to the planning area. The impacts to water quality from the increased wildland fire suppression infrastructure would occur in addition to authorized public land uses, which are expected to increase over time. The short-term cumulative impacts to water quality from implementing Alternative III are expected to be reduced in the long term by reducing the risk for impacts to water quality from wildland fire across the planning area.

Cumulative Impacts from Alternative IV

In Alternative IV, management actions or authorized uses in RCAs would result in cumulative effects to water quality in addition to actions and uses that have already occurred. Alternative IV has fewer authorized land uses and more active restoration of riparian areas containing water quality impaired streams than Alternatives I, II, and III. The increased wildland fire suppression emphasis would be expected to result in fewer cumulative impacts to water quality from wildland fire and a reduced potential for wildland fire to spread between Federal, State and private lands. VMAs C and D have first and second priority for wildland fire suppression during multiple ignitions and contain 50 miles (40%) of water quality impaired streams not at proper functioning condition (PFC) in the planning area. Alternative IV has the most noxious and invasive weed treatments of all alternatives and would reduce the spread of noxious weeds and invasive plants between the Federal, State, and private land.

The cumulative effects of transportation and travel actions are expected to be less than Alternatives I, II, III, and VI but slightly more than Alternative V due to travel limitations and closures for the planning area, including the Bruneau-Jarbidge Rivers Wilderness. This, combined with the active restoration emphasis, is likely to result in more miles of road in RCAs containing water quality impaired streams to be improved or modified to reduce impacts to water quality. Impacts to water quality would continue to occur on Federal, State and private land and influence water quality on the public land. Cumulative effects from ROW avoidance and exclusion areas, and oil and gas and geothermal development would be less than expected for Alternatives I, II, III, and VI but more than Alternative V. Restoration actions to reduce impacts to water quality and quantity from existing ROWs would reduce cumulative impacts on the public land. All lands within the analysis area would be expected to continue to have an increase in these human uses and are likely to influence water quality in the planning area.

The cumulative impacts from implementing the goals and objectives for riparian and water resource management are expected to have localized moderate impacts to water quality in addition to impacts to water quality that would occur on other lands. Implementing the conservation and restoration priorities in the ARMS (Appendix D; Tables D-3, D-4, and D-5) would moderate impacts from actions on public lands which would not occur on other lands within or adjacent to the planning area. Cumulative impacts from implementing Alternative IV are expected to be more improvement in water quality and a greater likelihood of meeting State water standards than No Action Alternative and Alternative I, II, III and VI. Alternative IV is the most likely to achieve State water quality standards over the life of the plan of all alternatives because of the active restoration emphasis.

Cumulative Impacts from Alternative V

Alternative V relies on natural recovery rates for water quality in water quality impaired streams and riparian areas not at PFC, using limited amounts of active restoration. This alternative would have the fewest authorized land uses of all alternatives and therefore the fewest cumulative impacts to water quality of all alternative.

Alternative V includes no additional infrastructure for wildland fire suppression which would maintain or potentially increase the risk for impacts to water quality due to wildland fire. This alternative would have the least amount of permitted grazing of all alternatives which would result in the fewest cumulative effects to water quality from livestock grazing on the public land than any other alternative. Grazing impacts may be shifted to other nearby lands which may result in cumulative effects to water quality on the public land. Alternative V would have the fewest cumulative impacts to water quality related to transportation and travel, ROWs, leasable, salable, and locatable mineral development activities. Designating the Sagebrush Sea Area of Critical Environmental Concern as a critical suppression area with management objectives that include minimizing public land uses would reduce the potential for cumulative impacts to water quality. Alternative V is expected to have the fewest cumulative impacts to water quality on public land within the planning area and to the cumulative impacts analysis area.

Cumulative Impacts from Alternative VI (Proposed RMP)

Alternative VI includes the same emphasis on improved wildland fire suppression infrastructure as Alternative III and the same emphasis on active restoration as Alternative IV. Management strategies most beneficial for enhancing wildland fire suppression capabilities, management of fuels, and reducing

wildland fire would be emphasized and would occur concurrently with commodity uses such as livestock grazing, recreation, transportation and travel, land use authorizations, and minerals exploration. The amount of authorized public land uses and potential for cumulative impacts to water quality within the cumulative impacts analysis area for Alternative VI would be most similar to Alternative III.

Alternative III would have an increased potential for impacts to water quality from wildland fire suppression infrastructure. These new roads would result in a cumulative increase in road density in the cumulative impacts analysis area. The increase in roads to improve wildland fire suppression response times and improvements in water sources for suppression is expected to result in fewer miles of riparian area with reduced water quality to be impacted by wildland fire. Cumulative impacts to water quality from livestock grazing are expected to be similar to Alternative I; more than Alternatives IV and V, but less than Alternatives II and III. Alternative VI, similar to Alternative IV, emphasizes active restoration and is likely to result in similar road-related cumulative impacts to water quality because similar miles of road in RCAs are likely to be improved or modified to reduce impacts to water quality. The cumulative impacts of transportation and travel actions, ROW avoidance and exclusion areas, and oil and gas and geothermal development would be similar to Alternative III.

The cumulative impacts from implementing the goals and objectives for riparian and water resource management are expected to have localized moderate impacts to water quality in addition to impacts to water quality that would occur on other Federal, State and private land. Implementing the conservation and restoration priorities in the ARMS (Appendix D; Tables D-3, D-4, and D-5) would moderate impacts to water quality from actions on public lands which would not occur on Federal, State and private land within or adjacent to the planning area. The cumulative impacts to water quality from implementing Alternative VI are expected to be most similar to Alternative III with cumulative impacts due to active restoration being similar to Alternative IV.

4.3.5. Vegetation Communities

4.3.5.1. Upland Vegetation

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to upland vegetation:

- **Composition of each Vegetation Management Area (VMA) and the planning area by vegetation sub-group (VSG)** – Management actions prescribed in the alternatives might result in changes in the number of acres present in each VSG. Therefore, the relative composition of VSGs within each VMA or the planning area might change by alternative.
- **Composition of each VMA and the planning area by successional stage** – Successional stages are early-, mid-, and late-successional for VSGs dominated by native vegetation (i.e., Native Grassland, Native Shrubland). VSGs dominated by non-native vegetation (i.e., Annual, Non-Native Perennial, Non-Native Understory) are defined as “uncharacteristic” (LANDFIRE, 2007); vegetation communities in these VSGs do not follow processes defined for native communities. Management actions prescribed in the alternatives might result in changes in the relative proportions of each successional stage, conversion of uncharacteristic vegetation to one of the three native vegetation successional stages, or conversion of a native vegetation successional stage to uncharacteristic.
- **Potential for introduction and spread of noxious weeds and invasive plants** – No current inventory for acres occupied by noxious weeds exists. Additionally, only acres dominated by invasive annual vegetation have been quantified for the planning area. Acres where invasive plants are present, but not dominant, have not been quantified. Therefore, management actions were assessed for potential to decrease or increase acres occupied by noxious weeds and invasive plants.

Methods and Assumptions

Impacts to upland vegetation from management in the following sections of Chapter 2 were analyzed in detail: *Upland Vegetation*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Transportation and Travel*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for upland vegetation. Impacts from management for upland vegetation can be found under *Impacts from Upland Vegetation Actions* in the *Tribal Rights and Interests*, *Air Quality*, *Climate Change*, *Soil Resources*, *Wildlife*, *Special Status Plants*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Wild Horses*, *Livestock Grazing*, *National Historic Trails, Wilderness*, and *Economic Conditions* sections.

Acreages for riparian and wetland areas are not considered a component of the VSGs and are addressed in a separate analysis (see the *Riparian Areas and Wetlands* section). Likewise, special status plants and noxious weeds and invasive plants are addressed separately in the *Special Status Plants* and *Noxious Weeds and Invasive Plants* sections, respectively.

Data were summarized for the 2016 projected acreages for upland vegetation (baseline) in each VSG within each VMA. VSGs were further broken down by potential natural vegetation groups (PNVGs) and successional classes (S-Classes) within each PNVG. Management actions prescribed in each alternative were assessed to determine if they resulted in a change in S-Class acreage for the PNVG within or between VSGs. Treatment acres were estimated across PNVGs within VSGs to reflect priorities associated with individual management actions and resource concerns. For analysis purposes, treatments focused primarily on the Wyoming Sagebrush Steppe PNVG, as it is a dominant group and most of the conversion to annual or non-native dominated vegetation has occurred in this type.

Treatment acres were assigned proportionally to other dominant PNVGs within the VMA to reflect alternative objectives. Acreages for S-Classes by alternative were ultimately aggregated to VSGs within each VMA. S-Classes were aggregated into broader successional stages according to information contained in Landscape Fire and Resource Management Planning Tools Project LANDFIRE (LANDFIRE, 2007). Acreages for successional stages were aggregated by VMA. Acreages for VSGs and successional stages were converted to percent composition for each VMA and for the entire planning area (1,372,000 acres). These calculations included acres not classified in the original S-Class classification, acres for which there were no data, and unvegetated acres. For the analysis, all acreages resulting from actions prescribed in the alternatives were compared to the baseline acreages for upland vegetation.

In cases where it was not possible to quantify acres changed and change in composition, effects of actions were qualified in terms of whether there is potential for change in VSG or successional stage, or effects to the community within a VSG, including introduction and spread of noxious weeds and invasive plants.

Minor discrepancies in acres (± 3 acres or less) or percentages (± 1%) occurred as the result of rounding figures in summary calculations. These discrepancies do not affect overall comparison of VSG and successional stage composition in VMAs and the planning area.

Plant communities are inherently variable due to a number of environmental and biological forces (MacCracken et al., 1983), there is a general understanding that ecosystem stability is characterized by increasing species diversity and structural complexity (Kormondy, 1969; Odum, 1971). Species diversity refers to the number and type of species that occur in a community. Structural complexity refers to the number and type of layers present, as well as the arrangement of components of these layers (e.g., shrubs, grasses, forbs, biological soil crusts) within a community. Structural complexity resulting from the relative proportions of successional stages is also important at the landscape scale.

In general, greater species diversity and structural complexity would be more likely to support increases in soil stability, water infiltration, nutrient cycling, and energy flow; to provide habitat for greater sage-grouse (sage-grouse) and other sagebrush steppe obligates; and to provide for multiple use. In addition, native plants and naturally occurring native plant communities generally support a greater level of species

diversity and structural complexity than annual, non-native perennial, and non-native understory communities. Alternatives that result in proportions of successional stages more similar to reference conditions for PNVGs (LANDFIRE, 2007) result in more structural complexity at the landscape scale; in general for the planning area, this would mean a decrease in the proportion of early-successional native communities and an increase in the proportion of mid-successional native communities (LANDFIRE, 2007). These assumptions are incorporated into the analysis.

Additional assumptions used when analyzing the effects of actions on upland vegetation communities were:

- Classification for areas burned in 2011 wildland fires were projected for the year 2016. The resulting projected acreages were used as the baseline for this analysis.
- For comparison only, it is assumed that vegetation treatments would occur within 10 years of the signing of the Record of Decision. Desired plant species composition and structure typically would occur within 15 to 20 years following restoration treatments intended to move areas towards the Native Shrubland VSG.
- Vegetation treatments would be applied in locations and using materials and methods that maximize the potential for success and are appropriate for existing conditions. Otherwise stated, an area would not be treated unless there is a reasonable expectation of success.
- Toolboxes defined for each alternative would be utilized as appropriate to treat upland vegetation communities and maximize potential for success of treatments.
- With active management, adequate ground cover for site stabilization would occur within two to five years following surface-disturbing activities.
- Biological soil crusts would increase in cover and complexity with establishment of perennial vegetation and increased time with no or low levels of soil surface disturbance (Belnap and Eldridge, 2001; Belnap et al., 2001a; Hilty et al., 2004). Cover and complexity of biological soil crusts are dependent on site potential including soil texture and chemistry, vegetation cover, and precipitation. Generally, biological crust development is inversely proportional to vegetation cover and precipitation, i.e., the sites with low vegetative cover in low precipitation zones have greater potential for biological soil crusts to be a dominant component of the plant community (Belnap et al., 2001a). Recovery times are also dependent on site potential; recovery might begin in as little as five years, but might not be complete for a century or more (Belnap and Eldridge, 2001; Belnap et al., 2001a).
- The potential for any area to support the identified PNVG would change due to factors such as disturbance, soil loss or deposition, changes in soil physiology, or climate change. For this analysis, it was assumed that acres identified for the PNVGs would remain the same over the life of the plan.
- Vegetation treatments would result in eventual attainment of the stated objectives. Failed or partially-failed treatments would be identified through monitoring and retreated utilizing adaptive management methods until the objectives are met.
- Since wildland fire is an episodic event, untreated native vegetation and treated areas would burn over the life of the plan. Fire size would be smaller in critical suppression areas than in conditional suppression areas.
- Vegetation treatments would be applied proactively to meet resource objectives or reactively following wildland fire.
- Cultivars of native species would be considered as native. Communities dominated by native cultivars would be classified in the Native Grassland or Native Shrubland VSGs. In general, these communities would be expected to emulate native communities with respect to structural qualities and ecosystem processes.
- Noxious weeds and invasive plants would continue to be introduced into upland vegetation communities as a result of land uses, wildlife movements, and wind.
- Yearly climatic variability would influence the health and productivity of upland vegetation communities, but would be a common influence regardless of alternative.
- PNVGs comprising less than 10% of the total acres for the VSG or that occur as small patches over the landscape were assumed to be treated as inclusions within dominant vegetation types.

- Natural successional processes would continue to occur in plant communities. For analysis purposes, natural processes are assumed to be consistent for all alternatives and are not accounted for here. All change represented in the analysis are a result of management actions.
- The degree of impact attributed to management actions would be influenced by multiple factors including, but not limited to, current vegetation type and condition; the type, seasonal timing, and degree of disturbance; yearly climatic variability including temperature and precipitation; and other mitigating or constraining actions.
- Impacts that result from management actions, authorizations, or allocations that result in surface disturbance are assumed to occur in proportion to the area affected.

Direct and Indirect Impacts

Impacts from Upland Vegetation Actions

The following indicators were used to analyze the impacts of Upland Vegetation actions on upland vegetation:

- Composition of each Vegetation Management Area (VMA) and the planning area by vegetation sub-group (VSG),
- Composition of each VMA and the planning area by successional stage, and
- Potential for introduction and spread of noxious weeds and invasive plants.

Upland vegetation actions directly affect the vegetation composition of the planning area, both with respect to VSG as well as successional stage. Table 4-79 identifies changes in composition of the planning area by VSG by alternative, while Table 4-80 identifies changes in composition of the planning area by successional stage by alternative.

Table 4-79. Changes in Composition of the Planning Area by Vegetation Sub-Group by Alternative (Acres)

VSG	Baseline	Alternative						
		No Action	I	II	III	IV	V	VI
Annual	125,000	120,000	78,500	45,500	54,250	45,500	84,500	68,250
Non-Native Perennial	356,000	402,000	308,000	455,000	425,000	161,000	157,000	199,000
Non-Native Understory	60,000	40,000	35,000	41,000	59,000	132,000	259,000	101,000
Native Grassland	476,000	476,000	243,000	476,000	259,000	169,000	278,000	226,000
Native Shrubland	306,000	285,000	659,000	306,000	507,000	816,000	545,000	729,000
Unvegetated Areas	48,000	48,000	48,000	48,000	67,000	48,000	48,000	48,000
No Data	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Table 4-80. Changes in Composition of the Planning Area by Successional Stage by Alternative (Acres)

Successional Stage	Baseline	Alternative						
		No Action	I	II	III	IV	V	VI
Early	477,000	476,000	242,000	477,000	260,000	170,000	279,000	227,000
Mid	88,000	52,000	442,000	88,000	292,000	597,000	327,000	508,000
Late	216,000	224,000	216,000	216,000	212,000	216,000	216,000	216,000

Successional Stage	Baseline	Alternative						
		No Action	I	II	III	IV	V	VI
Unclassified Native Shrubland	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Uncharacteristic	540,000	569,000	421,000	540,000	538,000	338,000	499,000	370,000
Unvegetated Areas	48,000	48,000	48,000	48,000	67,000	48,000	48,000	48,000
No Data	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Impacts from Management Specific to the No Action Alternative

The effect of actions for upland vegetation in the No Action Alternative would be to increase the relative proportion of non-native perennial communities through conversion of annual communities and removal of shrubs in non-native understory communities. Vegetation in the planning area would continue to be dominated by early- and late-successional native communities and uncharacteristic vegetation, primarily in the form of non-native perennial communities. This results in a rather homogeneous landscape with limited structural and species diversity.

With loss of sagebrush habitats, shrub islands would become increasingly valuable as refugia for wildlife, soil biota, and ecological functions such as water infiltration and nutrient cycling (Eldridge and Rosentreter, 2004; Longland and Bateman, 2002). The dominance of non-native perennial communities limits potential for diversification of structure and species composition through water and nutrient competition with sagebrush and native perennial grasses (D'Antonio and Vitousek, 1992).

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction for protection of existing vegetation and newly treated areas. These management actions would reduce or eliminate over-allocation, particularly during vulnerable periods such as growing seasons, drought periods, or seeding establishment. In the long term, these actions would promote ecological processes including soil stability, water infiltration, nutrient cycling, and energy flow; maintain or enhance habitat for sage-grouse and other sagebrush steppe obligate species; and facilitate multiple uses of public lands.

Impacts from Management Specific to Alternative I

Upland vegetation actions would increase the relative proportion of the Native Shrubland VSG through conversion of annual, non-native perennial, non-native understory, and native grassland communities. Table 4-81 identifies the change in composition of VMAs by VSG.

Actions in Alternative I would decrease the relative proportion of communities dominated by uncharacteristic and early-successional native vegetation and increase the relative proportion of communities dominated by mid-successional native vegetation. Actions resulting in an increase in the relative proportion of mid-successional native shrubland communities would enhance species diversity and structural complexity throughout the planning area. Increased numbers of native shrubland patches would create islands for seed dispersal and habitat for small mammals that would assist in the seed dispersal process (Longland and Bateman, 2002). Table 4-82 identifies the change in composition of VMAs by successional stage.

The establishment of 75 ungrazed reference areas (12,000 acres) would provide the ability to observe both natural processes and treatment effects in the absence of livestock grazing use. Inclusion of biological soil crusts in monitoring and adaptive management procedures would enhance landscape stability by detection and management of processes that might not be apparent through monitoring of vascular vegetation only (Ponzetti and McCune, 2001).

Table 4-81. Change in Composition of Vegetation Management Areas by Vegetation Sub-Group in Alternative I (Acres)

VSG	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Annual	83,000	56,000	39,000	20,000	2,000	2,000	1,000	500
Non-Native Perennial	94,000	96,000	212,000	169,000	46,000	30,000	4,000	13,000
Non-Native Understory	3,000	3,000	19,000	13,000	26,000	7,000	12,000	12,000
Native Grassland	34,000	42,000	211,000	106,000	150,000	75,000	81,000	20,000
Native Shrubland	5,000	22,000	125,000	298,000	78,000	188,000	98,000	151,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	100	100	400	400

Table 4-82. Change in Composition of Vegetation Management Areas by Successional Stage in Alternative I (Acres)

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Early	34,000	42,000	211,000	106,000	149,000	75,000	82,000	20,000
Mid	2,000	19,000	32,000	206,000	39,000	148,000	15,000	68,000
Late	3,000	3,000	92,000	92,000	39,000	39,000	81,000	81,000
Unclassified Native Shrubland	0	0	1,000	1,000	300	300	2,000	2,000
Uncharacter-istic	179,000	155,000	269,000	201,000	74,000	39,000	17,000	25,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	200	200	400	400

VMA A

When compared to baseline vegetation acreages, the composition of VMA A would be modified to contain a greater proportion of plant communities dominated by perennial vegetation and increasing the relative proportion of native communities. These changes would most likely occur within the Wyoming Sagebrush Steppe potential natural vegetation groups (PNVG), as it is the dominant PNVG in VMA A. The increased proportion of native grassland and shrubland communities would increase species diversity and structural complexity; however, this would be limited within the VMA, as the dominant VSG would remain Non-Native Perennial. Natural succession from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). Although Alternative I allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSG over the life of the plan due to low availability of shrubland communities for seed dispersal. Since sagebrush seed lacks mechanisms for dispersal much more than 100 feet from a mother plant and typically within three feet of the canopy edge (Meyer, 1994; Welch, 2005), low density of seed sources would limit potential for dispersal and establishment. Treatments would result in a decrease in the relative proportion of uncharacteristic vegetation, coupled with increases in communities in early- and mid-successional condition. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Therefore most of the acres

treated to move towards the Native Shrubland VSG would remain in either early- or mid-successional stages over the life of the plan.

VMA B

While the Annual VSG is not dominant in VMA B, Alternative I would convert a portion of the projected acreage for this sub-group to the Native Shrubland VSG, reducing the potential for spread of invasive annual vegetation. Vegetation treatments would almost double the relative proportion of the Native Shrubland VSG. This would result in greater species diversity and structural complexity through conversion of annual, non-native perennial, and native grassland communities to native shrubland communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG, as it is the dominant PNVG in VMA B. As in VMA A, natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007).

Timeframes for conversion to the Native Shrubland VSG would be accelerated by actions to treat annual-dominated, non-native perennial, or native grassland communities by seeding or planting of shrubs along with perennial herbaceous vegetation. This would result in reductions in the relative proportion of uncharacteristic vegetation and early-successional communities. The relative proportion of communities in mid-successional condition would increase by 544%. Likewise, conversion of non-native understory communities to native shrubland communities using techniques ranging from interseeding native plants in the understory to full restoration (Cox and Anderson, 2004; Stevens, 2004) would likely result in mid-successional communities over the life of the plan. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007).

Alternative I allows for natural succession of shrubs in the Native Grassland VSG, which is more likely to occur than in VMA A due to increased availability of shrubland vegetation. However, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan due to timeframes for natural succession and naturally low recruitment, establishment, and survival rates (LANDFIRE, 2007; Meyer, 1994). Alternative I also allows for assisted succession of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages within VMA B.

VMA C

Actions under Alternative I for VMA C would have the primary effect of increasing the relative proportion of the Native Shrubland VSG in the VMA by more than double. Most of the effects would occur in the Wyoming Sagebrush Steppe PNVG, as it is the dominant PNVG in VMA C. Treatments would move vegetation from the Non-Native Perennial, Non-Native Understory, and Native Grassland VSGs to the Native Shrubland VSG, resulting in a shift from communities dominated by uncharacteristic and early-successional communities to mid-successional communities. This would ultimately result in a larger proportion of the VMA being occupied by plant communities with a greater level of species diversity and structural complexity (Cox and Anderson, 2004). Alternative I allows for natural succession of shrubs in the Native Grassland VSG, which is more likely to occur than in VMA A due to increased availability of shrubland vegetation. However, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan due to timeframes for natural succession and naturally low recruitment, establishment, and survival rates (LANDFIRE, 2007; Meyer, 1994). It is also unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Alternative I also allows for assisted succession of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages within VMA C.

VMA D

VMA D contains a greater diversity of vegetation communities due to higher elevations. Treatments would focus on the dominant PNVGs: Black and Low Sagebrush, Mountain Big Sagebrush, Wyoming Sagebrush Steppe, and Basin Big Sagebrush. The Annual VSG is not dominant in VMA D; however, Alternative I would convert a portion of the projected acreage for this sub-group to the Native Shrubland

VSG, reducing the potential for spread of invasive annual vegetation. Actions under Alternative I for VMA D would have the primary effect of increasing the structural complexity of native grassland communities by adding a shrub component and increasing the relative proportion of the Native Shrubland VSG to 73% of the VMA. This would reduce the relative proportion of herbaceous-dominated, early-successional communities to less than 10% and increase the proportion of shrub-dominated, mid-successional communities to nearly a third of the VMA. The increased elevation in VMA D may translate to higher effective precipitation and greater potential for community diversity (Goodrich, 2005). Unassisted succession from one successional stage to another would be dependent on the type of plant community (LANDFIRE, 2007) and the presence of seed sources. Alternative I allows for natural succession of shrubs in the Native Grassland VSG, which is more likely to occur in VMA D due to the high proportion of the Native Shrubland VSG. There would be some small shifts in relative proportions of the Native Grassland and Native Shrubland VSGs over the life of the plan, as timeframes for natural succession between early- and mid-successional stages in some higher elevation vegetation types (e.g., mountain shrub, aspen, mountain mahogany, mountain big sagebrush) are less than 12 years (LANDFIRE, 2007). Alternative I also allows for diversification of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages within VMA D.

Impacts from Management Specific to Alternative II

The effect of upland vegetation actions in Alternative II would be similar to the No Action Alternative. Compared to baseline vegetation acreages, the relative proportion of the Non-Native Perennial VSG would increase through conversion of annual and non-native understory communities. The relative proportions of the Native Grassland and Native Shrubland VSGs would be maintained while enhancing diversity through seeding of late-successional grasses. Increases in the Non-Native Perennial VSG and the grass component of native plant communities would increase available forage for livestock. Removal of shrubs in non-native understory communities would result in a decrease in structural complexity throughout the planning area. Likewise, focus on use of non-native and fire-tolerant species (such as crested wheatgrass) in vegetation treatments would discourage recovery or recruitment of native plants in treated areas (D'Antonio and Vitousek, 1992; Marlette and Anderson, 1986). Table 4-83 identifies the change in composition of VMAs by VSG.

Alternative II would be unlikely to change the current relative proportions of native community successional stages or uncharacteristic vegetation. Table 4-84 identifies the change in successional stage by VMA.

The establishment of 52 ungrazed reference areas (2,000 acres) would provide the ability to observe both natural processes and treatment effects in the absence of livestock grazing.

Table 4-83. Change in Composition of Vegetation Management Areas by Vegetation Sub-Group in Alternative II (Acres)

VSG	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Annual	83,000	33,000	39,000	10,000	2,000	2,000	1,000	500
Non-Native Perennial	94,000	144,000	212,000	247,000	46,000	59,000	4,000	5,000
Non-Native Understory	3,000	3,000	19,000	13,000	26,000	13,000	12,000	12,000
Native Grassland	34,000	34,000	211,000	211,000	150,000	150,000	81,000	81,000
Native Shrubland	5,000	5,000	125,000	125,000	78,000	78,000	98,000	98,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	100	100	400	400

Table 4-84. Change in Composition of Vegetation Management Areas by Successional Stage in Alternative II (Acres)

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Early	34,000	34,000	211,000	211,000	149,000	149,000	82,000	82,000
Mid	2,000	2,000	32,000	32,000	39,000	39,000	15,000	15,000
Late	3,000	3,000	92,000	92,000	39,000	39,000	81,000	81,000
Unclassified Native Shrubland	0	0	1,000	1,000	300	300	2,000	2,000
Uncharacter-istic	179,000	179,000	269,000	269,000	74,000	74,000	17,000	17,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	200	200	400	400

VMA A

When compared to baseline vegetation acreages, the composition of VMA A would be modified by Alternative II to contain a greater proportion of plant communities dominated by perennial vegetation, and increasing the relative proportion of the Non-Native Perennial VSG by 53%. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. The shift in dominance from annual to non-native perennial vegetation would increase resilience to fire disturbance (Monsen, 1994), but would limit both species diversity and structural complexity within VMA A. Natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). Since no treatments in Alternative II would accelerate this process, it is likely that the relative proportion of successional stages in native plant communities would remain relatively consistent over the life of the plan. Treatments would not affect the relative proportion of uncharacteristic vegetation within VMA A.

VMA B

While the Annual VSG is not dominant in VMA B, Alternative II would convert a portion of the projected acreage for this sub-group to the Native Shrubland VSG, reducing the potential for spread of invasive annual vegetation. Vegetation treatments would increase the relative proportion of the Non-Native Perennial VSG by about 17%. Some of this change would occur through removal of shrubs in the Non-Native Understory VSG, which would slightly reduce the relative proportion of this VSG in VMA B, subsequently reducing structural complexity in those areas. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. As in VMA A, the shift in dominance from annual invasive to non-native perennial vegetation would increase resilience to fire disturbance (Monsen, 1994), but would limit both species diversity and structural complexity within VMA B. Natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). The only actions in Alternative II that would accelerate this process would be the inclusion of shrubs in emergency stabilization and burned area rehabilitation (ES&BAR) seedings in burned native grassland and native shrubland communities. While diversification of grasses by seeding of late-successional grasses is allowed for both Native Grassland and Native Shrubland VSGs, it is unlikely that the relative proportion of successional stages in native plant communities would change over the life of the plan. Treatments would not affect the relative proportion of uncharacteristic vegetation within VMA B.

VMA C

Alternative II for VMA C would have the primary effect of increasing the relative proportion of the Non-Native Perennial VSG in the VMA by 28%. This change would occur through removal of shrubs in the Non-Native Understory VSG and reducing the relative proportion of this VSG in VMA C, subsequently reducing structural complexity in those areas. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. Natural shifts from herbaceous-dominated native grassland communities to

communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). As in Alternative I, allowance for natural succession of shrubs in the Native Grassland VSG under Alternative II would not likely result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. The only actions in Alternative II that would accelerate this process would be the inclusion of shrubs in ES&BAR seedings in burned native grassland and native shrubland communities. And while seeding of late-successional grasses is employed to diversify both native grassland and native shrubland communities, it is unlikely that the relative proportion of successional stages in native plant communities would change over the life of the plan. Treatments would not affect the relative proportion of uncharacteristic vegetation within VMA C.

VMA D

VMA D contains a greater diversity of vegetation communities due to higher elevation. Treatments would focus on the dominant PNVGs currently occupied by non-native perennial or non-native understory communities: Black and Low Sagebrush, Mountain Big Sagebrush, and Wyoming Sagebrush Steppe. The Annual VSG is not dominant in VMA D; however, Alternative II would convert a portion of the projected acreage for this sub-group to the Non-Native Perennial VSG, reducing the potential for spread of invasive annual vegetation. Alternative II would triple the relative proportion of the Non-Native Perennial VSG in VMA D. This change would occur through removal of shrubs in the Non-Native Understory VSG and eliminating this VSG in VMA D. The increased elevation in VMA D may translate to higher effective precipitation and greater potential for community diversity (Goodrich, 2005). Unassisted succession from one successional stage to another would be dependent on the type of plant community (LANDFIRE, 2007) and the presence of seed sources. As in Alternative I, allowance of natural succession of shrubs in the Native Grassland VSG might result in some small shifts in relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan, as timeframes for natural succession between early- and mid-successional stages in some higher elevation vegetation types (e.g., mountain shrub, aspen, mountain mahogany, mountain big sagebrush) are less than 12 years (LANDFIRE, 2007). The only actions in Alternative II that would accelerate this process would be the inclusion of shrubs in ES&BAR seedings in burned native grassland and native shrubland communities. While seeding of late-successional grasses is allowed to diversify both native grassland and native shrubland communities, it is unlikely that the relative proportion of successional stages in native plant communities would change over the life of the plan. Treatments would not affect the relative proportion of uncharacteristic vegetation within VMA D.

Impacts from Management Specific to Alternative III

Alternative III would reduce the amount and continuity of fine fuels throughout the planning area. This would be accomplished by increasing the relative proportion of non-native perennial communities through conversion of annual communities, and increasing the relative proportion of native shrubland communities through the addition of shrubs to native grassland communities. Areas treated with fire-tolerant and fire-resistant species, such as crested wheatgrass, would tend to discourage recovery or recruitment of native species in treated areas (D'Antonio and Vitousek, 1992; Marlette and Anderson, 1986). Treatments in native communities would result in a decrease in the relative proportion of early-successional, native communities and an increase in the relative proportion of mid-successional communities. Creation of fuel breaks, coupled with the placement of vegetation treatments to create discontinuous fuels, would result in fragmentation of contiguous blocks of native shrubland communities. Increased numbers of native shrubland patches would create islands for seed dispersal and habitat for small mammals that would assist the seed dispersal process (Longland and Bateman, 2002). However, these effects would be discontinuous over the landscape due to vegetation patchiness. Should wildland fire occur, discontinuity of vegetation types would result in a mosaic of burn intensities and unburned patches that would function as refugia for native seed dispersal (Longland and Bateman, 2002; Whisenant, 1990).

The establishment of 75 ungrazed reference areas (3,000 acres) would provide the ability to observe both natural processes and treatment effects in the absence of livestock grazing.

Table 4-85. Change in Composition of Vegetation Management Areas by Vegetation Sub-Group in Alternative III (Acres)

VSG	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Annual	83,000	42,000	39,000	10,000	2,000	2,000	1,000	250
Non-Native Perennial	94,000	128,000	212,000	242,000	46,000	49,000	4,000	6,000
Non-Native Understory	3,000	3,000	19,000	19,000	26,000	26,000	12,000	11,000
Native Grassland	34,000	37,000	211,000	96,000	150,000	68,000	81,000	58,000
Native Shrubland	5,000	5,000	125,000	230,000	78,000	152,000	98,000	120,000
Unvegetated Areas	2,000	6,000	24,000	33,000	11,000	16,000	11,000	12,000
No Data	500	500	300	300	100	100	400	400

Table 4-86. Change in Composition of Vegetation Management Areas by Successional Stage in Alternative III (Acres)

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Early	34,000	37,000	211,000	96,000	149,000	68,000	82,000	59,000
Mid	2,000	2,000	32,000	138,000	39,000	113,000	15,000	39,000
Late	3,000	3,000	92,000	91,000	39,000	39,000	81,000	79,000
Unclassified Native Shrubland	0	0	1,000	1,000	300	300	2,000	2,000
Uncharacter-istic	179,000	173,000	269,000	270,000	74,000	77,000	17,000	17,000
Unvegetated Areas	2,000	6,000	24,000	33,000	11,000	16,000	11,000	12,000
No Data	500	500	300	300	200	200	400	400

VMA A

When compared to baseline vegetation acreages, the composition of VMA A would contain a greater proportion of plant communities dominated by perennial vegetation, and increasing the relative proportion of the Non-Native Perennial VSG by 36%. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG, as it is the dominant PNVG in VMA A. The shift in dominance from annual invasive to non-native perennial vegetation would result in greater resilience to fire disturbance (Monsen, 1994), but would limit both species diversity and structural complexity in VMA A. Natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). Since no treatments in Alternative III would accelerate this process, it is likely that the relative proportion of successional stages in native plant communities would remain relatively consistent over the life of the plan. Treatments would not result in a change in the relative proportion of uncharacteristic vegetation within VMA A.

VMA B

While the Annual VSG is not dominant in VMA B, Alternative III would convert a portion of the projected acreage for this sub-group to the Non-Native Perennial VSG, reducing the potential for spread of invasive annual vegetation. Alternative III would increase the relative proportion of the Native Shrubland VSG

84%. This would result in greater species diversity and structural complexity through conversion of native grassland communities to native shrubland communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. As in VMA A, natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). This timeframe would be accelerated by seeding or planting shrubs in native grassland communities. This would result in a 54% reduction in the relative proportion in VMA B of early-successional communities. The relative proportion of communities in mid-successional condition would triple. The treated acres are unlikely to reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). A slight decrease in the relative proportion of late-successional communities would occur due to removal of shrubs for the creation of fuel breaks (see *Impacts from Wildland Fire Ecology and Management Actions*). Likewise, slight increases in the relative proportion of uncharacteristic vegetation and unvegetated areas would occur due to the creation of vegetated and unvegetated fuel breaks. These fire breaks would reduce potential for fire spread that would further reduce acreages of late-successional native shrubland.

VMA C

Alternative III for VMA C would have the primary effect of nearly doubling the relative proportion of the Native Shrubland VSG in the VMA. Most of the effects would occur in the Wyoming Sagebrush Steppe PNVG, as it is the dominant PNVG in VMA C. Alternative III would move vegetation from the Native Grassland VSG to the Native Shrubland VSG, resulting in a shift in the relative proportion of communities dominated by early-successional vegetation to mid-successional vegetation. This would ultimately result in a larger proportion of the VMA being occupied by plant communities with a greater level of species diversity and structural complexity. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Slight increases in the relative proportion of uncharacteristic vegetation and unvegetated areas would also occur due to the creation of vegetated and unvegetated fuel breaks (see *Impacts from Wildland Fire Ecology and Management Actions*).

VMA D

Treatments would focus on the dominant PNVGs: Black and Low Sagebrush, Mountain Big Sagebrush, Wyoming Sagebrush Steppe, and Basin Big Sagebrush. Alternative III would convert a portion of the projected acreage in the Annual VSG to the Native Grassland VSG, reducing the potential for spread of invasive annual vegetation. Actions in Alternative III for VMA D would have the primary effect of increasing the structural complexity of native grassland communities by adding a shrub component and increasing the relative proportion of Native Shrubland VSG by 22%. This would reduce the relative proportion of herbaceous-dominated, early-successional communities and increase shrub-dominated, mid-successional communities. Creation of fuel breaks would result in a slight increase in the Non-Native Perennial VSG with concurrent reduction of the Non-Native Understory VSG due to the removal of shrubs (see *Impacts of Wildland Fire Ecology and Management Actions*). Creation of fuel breaks would also result in a slight reduction in the relative proportion of late-successional native shrubland due to the removal of shrubs.

Impacts from Management Specific to Alternative IV

Alternative IV would create a landscape dominated by native vegetation with an emphasis on mid-successional shrubland communities and increase the amount and continuity of communities dominated by shrubs. Actions would increase both the relative proportion and continuity of the Native Shrubland VSG through conversion of annual, non-native perennial, and non-native understory communities and diversification of native grassland communities. Table 4-87 identifies the change in composition of VMAs by VSG.

The addition of shrubs to existing non-native perennial communities would increase the relative proportion of the Non-Native Understory VSG. Increases in the relative proportion of mid-successional native shrubland communities would increase species diversity and structural complexity throughout the planning area. Table 4-88 identifies the change in composition of VMAs by successional stage. Increased numbers of native shrubland patches would create islands for seed dispersal and habitat for small mammals that would assist that process (Longland and Bateman, 2002); increased size of shrub patches would enhance local species diversity (Whisenant, 1990).

The establishment of 75 ungrazed reference areas (12,000 acres) would provide the ability to observe both natural processes and treatment effects in the absence of livestock grazing. Inclusion of biological soil crusts in monitoring and adaptive management procedures would enhance landscape stability by detection and management of processes that might not be apparent through monitoring of vascular vegetation only (Ponzetti and McCune, 2001).

Table 4-87. Change in Composition of Vegetation Management Areas by Vegetation Sub-Group in Alternative IV (Acres)

VSG	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Annual	83,000	33,000	39,000	10,000	2,000	2,000	1,000	500
Non-Native Perennial	94,000	88,000	212,000	73,000	46,000	0	4,000	0
Non-Native Understory	3,000	3,000	19,000	76,000	26,000	48,000	12,000	5,000
Native Grassland	34,000	17,000	211,000	106,000	150,000	37,000	81,000	9,000
Native Shrubland	5,000	78,000	125,000	341,000	78,000	215,000	98,000	182,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	100	100	400	400

Table 4-88. Change in Composition of Vegetation Management Areas by Successional Stage in Alternative IV (Acres)

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Early	34,000	17,000	211,000	106,000	149,000	37,000	82,000	10,000
Mid	2,000	76,000	32,000	248,000	39,000	174,000	15,000	99,000
Late	3,000	3,000	92,000	92,000	39,000	39,000	81,000	81,000
Unclassified Native Shrubland	0	0	1,000	1,000	300	300	2,000	2,000
Uncharacter-istic	179,000	123,000	269,000	159,000	74,000	50,000	17,000	5,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	200	200	400	400

VMA A

When compared to baseline vegetation acreages, the composition of VMA A would contain a greater proportion of plant communities dominated by perennial vegetation, and an increase in the relative proportion of the Native Shrubland VSG by 1,460%. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG, as it is the dominant PNVG in VMA A. The increased proportion and continuity of native shrubland vegetation would result in greater species diversity and structural complexity. While natural succession of shrubs would occur in untreated, existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Natural succession from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). This timeframe would be accelerated by seeding or planting of shrubs in native grassland communities. This would result in a

reduction by more than half in the relative proportion of communities in early-successional condition and a 3700% increase in the relative proportion of communities in mid-successional condition. Treated acres are unlikely to reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007); therefore the relative proportion of the late-successional stage would likely remain static over the life of the plan. Most of the acres treated to move towards the Native Shrubland VSG would remain in either early- or mid-successional stages. Although Alternative IV allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. Alternative IV also allows for assisted succession of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages within VMA A.

VMA B

While the Annual VSG is not dominant, Alternative IV would convert a portion of the projected acreage for this sub-group to the Non-Native Perennial and Native Shrubland VSGs, reducing the potential for spread of invasive annual vegetation. Alternative IV would increase the relative proportion of the Native Shrubland VSG by about 173%. This would result in greater species diversity and structural complexity through conversion of annual, non-native perennial, non-native understory, and native grassland communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. As in VMA A, natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). This timeframe would be accelerated by seeding or planting of shrubs. This would result in a reduction in the relative proportion in VMA B of early-successional communities by about half. The relative proportion of communities in mid-successional condition would increase by 675%. Likewise, conversion of non-native understory communities to native shrubland communities using techniques ranging from interseeding native plants in the understory to full restoration (Cox and Anderson, 2004; Stevens, 2004) would likely result in mid-successional communities over the life of the plan. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Although Alternative IV allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. Alternative IV also allows for assisted succession of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatment would affect relative proportions of these successional stages within VMA B. While natural succession of shrubs would occur in untreated existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities and forbs to non-native understory communities would contribute additional complexity at a community level.

Under Alternative IV-A, vegetation treatments would be sufficient to restore all non-native perennial communities to native shrubland communities in the Inside Desert Area of Critical Environmental Concern (ACEC) (15,000 acres; 2% of VMA B) within VMA B. Vegetation treatment levels would also restore all non-native perennial communities to native shrubland communities in the Inside Desert ACEC (6,000 acres; less than 1% of VMA B) within VMA B under Alternative IV-B. Due to the smaller acreage of the ACEC in Alternative IV-B, a greater proportion of the treatment acres would occur outside the ACEC.

VMA C

Alternative IV for VMA C would have the primary effect of increasing the relative proportion of the Native Shrubland VSG in the VMA by 176%. Most of the effects would occur in the Wyoming Sagebrush Steppe PNVG. Alternative IV would move vegetation from the Non-Native Perennial, Non-Native Understory, and Native Grassland VSGs to the Native Shrubland VSG, resulting in a shift from communities dominated by uncharacteristic and early-successional vegetation to mid-successional vegetation. This would ultimately result in a larger proportion of the VMA being occupied by plant communities with a greater level of species diversity and structural complexity. Although Alternative IV allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a change in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. It is also unlikely that any of the

treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Alternative IV allows for assisted succession of native shrubland communities by introducing forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages. While natural succession of shrubs would occur in untreated non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities and forbs to non-native understory communities would contribute additional complexity at a community level.

Under Alternative IV-A, vegetation treatment would be sufficient to restore all non-native perennial communities to native shrubland communities in the Inside Desert ACEC (21,000 acres; 7% of VMA C) and Jarbidge Foothills ACEC (2,000 acres; less than 1% of VMA C). Vegetation treatment would also restore all non-native perennial communities to native shrubland communities in the Inside Desert ACEC (15,000 acres; 5% of VMA C) and Jarbidge Foothills ACEC (2,000 acres; less than 1% of VMA C) under Alternative IV-B. Due to the smaller acreages of the ACECs in Alternative IV-B, a greater proportion of the treatment acres would occur outside the ACECs.

VMA D

Alternative IV would convert a portion of the projected acreage of the Annual VSG to the Native Shrubland VSG, reducing the potential for spread of invasive annual vegetation. Alternative IV would have the primary effect of increasing the structural complexity of native grassland communities by adding a shrub component and increasing the relative proportion of Native Shrubland VSG by 86%. This would reduce the relative proportion of herbaceous-dominated early-successional communities by 88%, with an increase in shrub-dominated mid-successional communities of almost 560%. The increased elevation in VMA D may translate to higher effective precipitation and greater potential for community diversity (Goodrich, 2005). Allowance for natural succession of shrubs would result in small shifts in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. Alternative IV also allows for diversification of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatment would affect relative proportions of these successional stages. While natural succession of shrubs would occur in untreated non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities and forbs to non-native understory communities would contribute additional complexity at a community level and within VMA D.

Impacts from Management Specific to Alternative V

Alternative V would increase the amount and continuity of communities dominated by shrubs within the planning area through conversion of annual, non-native perennial, and native grassland communities. Increased relative proportion of the Non-Native Understory VSG would provide for added structural complexity in existing non-native perennial communities. Table 4-89 identifies the change in composition of VMAs by VSG.

Increased relative proportion of mid-successional native shrubland communities would increase species diversity and structural complexity throughout the planning area. Table 4-90 identifies the change in composition of VMAs by successional stage. Increased numbers of native shrubland patches would create islands for seed dispersal and habitat for small mammals that would assist in the seed dispersal process (Longland and Bateman, 2002); increased size of shrub patches would tend to increase plant community species diversity (Whisenant, 1990).

The establishment of 40 ungrazed reference areas (193,000 acres) would provide the ability to observe both natural processes and treatment effects in the absence of this use on a landscape scale. Inclusion of biological soil crusts in monitoring and adaptive management procedures would enhance landscape stability by detection and management of processes that might not be apparent through monitoring of vascular vegetation only (Ponzetti and McCune, 2001) of livestock grazing.

Table 4-89. Change in Composition of Vegetation Management Areas by Vegetation Sub-Group in Alternative V (Acres)

VSG	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Annual	83,000	62,000	39,000	20,000	2,000	2,000	1,000	500
Non-Native Perennial	94,000	72,000	212,000	70,000	46,000	14,000	4,000	1,000
Non-Native Understory	3,000	26,000	19,000	160,000	26,000	58,000	12,000	15,000
Native Grassland	34,000	34,000	211,000	141,000	150,000	75,000	81,000	28,000
Native Shrubland	5,000	25,000	125,000	215,000	78,000	153,000	98,000	152,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	100	100	400	400

Table 4-90. Change in Composition of Vegetation Management Areas by Successional Stage in Alternative V (Acres)

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Early	34,000	34,000	211,000	141,000	149,000	75,000	82,000	28,000
Mid	2,000	23,000	32,000	122,000	39,000	113,000	15,000	69,000
Late	3,000	3,000	92,000	92,000	39,000	39,000	81,000	81,000
Unclassified Native Shrubland	0	0	1,000	1,000	300	300	2,000	2,000
Uncharacter-istic	179,000	159,000	269,000	250,000	74,000	74,000	17,000	17,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	200	200	400	400

VMA A

VMA A would be modified by Alternative V to contain a greater proportion of plant communities dominated by perennial vegetation and increase the relative proportion of the Non-Native Understory VSG by 767% and a 400% increase in the relative proportion of the Native Shrubland VSG through conversion of non-native perennial and annual communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. Treatments would result in native shrubland communities in mid-successional condition over the life of the plan. The increased proportion of native shrubland vegetation in VMA A would result in greater species diversity and structural complexity. Natural succession from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). No treatments are identified in Alternative V for either Native Grassland or Native Shrubland VSGs , and it is unlikely that the relative proportions of early- and late-successional communities would change due to natural succession over the life of the plan. Likewise natural succession of shrubs would occur in non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities would contribute additional complexity at a community level and within VMA A.

VMA B

The Annual VSG is not dominant in VMA B, however, Alternative V would convert a portion of the projected acreage to the Native Shrubland VSG, reducing the potential for spread of invasive annual vegetation. Alternative V would increase the relative proportions of the Non-Native Understory VSG by 742% and the Native Shrubland VSG by 72%. This would result in greater species diversity and structural complexity through conversion of annual, non-native perennial, and native grassland communities to non-native understory and native shrubland communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. As in VMA A, natural shifts from herbaceous-dominated native grassland communities to mid-successional communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). This timeframe would be accelerated by seeding or planting of shrubs. This would result in a reduction in the relative proportion in VMA B of early-successional communities by one-third and an increase in communities in mid-successional condition by almost double. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Although Alternative V allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. While natural succession of shrubs would occur in untreated existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities would contribute additional complexity at a community level and within VMA B.

VMA C

Alternative V would have the primary effect of increasing the relative proportion of the Non-Native Understory VSG by 123% and the Native Shrubland VSG in the VMA by almost double. Most of the effects would occur in the Wyoming Sagebrush Steppe PNVG. Treatments implemented under Alternative V would move vegetation from the Native Grassland VSG to the Native Shrubland VSG, resulting in a shift from communities dominated by early-successional vegetation to mid-successional vegetation. This would ultimately result in a larger proportion of the VMA being occupied by plant communities with a greater level of species diversity and structural complexity. Although Alternative V allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a change in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. It is also unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). While natural succession of shrubs would occur in untreated existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities would contribute additional complexity at a community level and within VMA C.

VMA D

Alternative V would convert a portion of the Annual VSG to the Native Shrubland VSG, reducing the potential for spread of invasive annual vegetation. Actions in Alternative V would have the primary effect of increasing the structural complexity of non-native perennial and native grassland communities by adding a shrub component. This would result in a slight increase in the relative proportion of non-native understory communities and an increase in native shrubland communities by 55%. The relative proportion of herbaceous-dominated, early-successional communities would be reduced by two-thirds, with an increase in shrub-dominated mid-successional communities by almost 360%. The increased elevation in VMA D may translate to higher effective precipitation and greater potential for community diversity (Goodrich, 2005). Unassisted succession from one successional stage to another would be dependent on the type of plant community (LANDFIRE, 2007) and the presence of seed sources. Natural succession of shrubs would result in some small shifts in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. Natural succession of shrubs in untreated existing non-native perennial communities would occur. However, competition from non-native perennial grasses would inhibit the process (Cox and Anderson, 2004; Stevens and Monsen, 2004).

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would create a landscape dominated by native vegetation with an emphasis on mid-successional shrubland communities and increase the amount and continuity of communities dominated by shrubs. Actions would increase both the relative proportion and continuity of the Native Shrubland VSG through conversion of annual, non-native perennial, and non-native understory communities and diversification of native grassland communities. Table 4-91 identifies the change in composition of VMAs by VSG.

The addition of shrubs to existing non-native perennial communities would increase the relative proportion of the Non-Native Understory VSG. Increases in the relative proportion of mid-successional native shrubland communities would increase species diversity and structural complexity throughout the planning area. Table 4-92 identifies the change in composition of VMAs by successional stage. Increased numbers of native shrubland patches would create islands for seed dispersal and habitat for small mammals that would assist that process (Longland and Bateman, 2002); increased size of shrub patches would enhance local species diversity (Whisenant, 1990).

The establishment of up to 52 ungrazed reference areas (2,000 acres) would provide the ability to observe both natural processes and treatment effects in the absence of livestock grazing. Inclusion of biological soil crusts in monitoring and adaptive management procedures would enhance landscape stability by detection and management of processes that might not be apparent through monitoring of vascular vegetation only (Ponzetti and McCune, 2001).

Table 4-91. Change in Composition of Vegetation Management Areas by Vegetation Sub-Group in Alternative VI (Proposed RMP) (Acres)

VSG	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Annual	83,000	56,000	39,000	10,000	2,000	2,000	1,000	250
Non-Native Perennial	94,000	96,000	212,000	73,000	46,000	30,000	4,000	0
Non-Native Understory	3,000	3,000	19,000	76,000	26,000	17,000	12,000	5,000
Native Grassland	34,000	42,000	211,000	106,000	150,000	37,000	81,000	41,000
Native Shrubland	5,000	22,000	125,000	341,000	78,000	216,000	98,000	150,000
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	100	100	400	400

Table 4-92. Change in Composition of Vegetation Management Areas by Successional Stage in Alternative VI (Proposed RMP) (Acres)

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Early	34,000	42,000	211,000	106,000	149,000	37,000	82,000	42,000
Mid	2,000	19,000	32,000	248,000	39,000	174,000	15,000	66,000
Late	3,000	3,000	92,000	92,000	39,000	39,000	81,000	81,000
Unclassified Native Shrubland	0	0	1,000	1,000	300	300	2,000	2,000
Uncharacter-istic	179,000	155,000	269,000	159,000	74,000	50,000	17,000	5,000

Successional Stage	VMA A		VMA B		VMA C		VMA D	
	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment	Baseline	Post-Treatment
Unvegetated Areas	2,000	2,000	24,000	24,000	11,000	11,000	11,000	11,000
No Data	500	500	300	300	200	200	400	400

VMA A

When compared to baseline vegetation acreages, the composition of VMA A would contain a greater proportion of plant communities dominated by perennial vegetation and increasing the relative proportion of native communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. The increased proportion of native grassland and shrubland communities would increase species diversity and structural complexity; however, this would be limited within the VMA, as the dominant VSG would remain Non-Native Perennial. Natural succession from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). Although Alternative VI allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan due to low availability of shrubland communities for seed dispersal. Since sagebrush seed lacks mechanisms for dispersal much more than 100 feet from a mother plant and typically within three feet of the canopy edge (Meyer, 1994; Welch, 2005), low density of seed sources would limit potential for dispersal and establishment. Treatments would result in a decrease in the relative proportion of uncharacteristic vegetation, coupled with increases in communities in early- and mid-successional condition. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Therefore most of the acres treated to move towards the Native Shrubland VSG would remain in either early- or mid-successional stages over the life of the plan.

VMA B

Alternative VI would convert a portion of the Annual VSG to the Non-Native Perennial and Native Shrubland VSGs, reducing the potential for spread of invasive annual vegetation. Vegetation treatments would increase the relative proportion of the Native Shrubland VSG by about 173%. This would result in greater species diversity and structural complexity through conversion of annual, non-native perennial, non-native understory, and native grassland communities to native shrubland communities. These changes would most likely occur within the Wyoming Sagebrush Steppe PNVG. Natural shifts from herbaceous-dominated native grassland communities to communities with shrub cover of 5% to 25% would take a minimum of about 20 years for the Wyoming Sagebrush Steppe PNVG (LANDFIRE, 2007). This timeframe would be accelerated by seeding or planting shrubs. This would result in a reduction in the relative proportion in VMA B of early-successional communities by about half. The relative proportion of communities in mid-successional condition would increase by about 675%. Likewise, conversion of non-native understory communities to native shrubland communities using techniques ranging from interseeding native plants in the understory to full restoration (Cox and Anderson, 2004; Stevens, 2004) would likely result in mid-successional communities over the life of the plan. It is unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Although Alternative VI allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a shift in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. Alternative VI also allows for assisted succession of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages within VMA B. While natural succession of shrubs would occur in untreated existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities and forbs to non-native understory communities would contribute additional complexity at a community level.

VMA C

Alternative VI would have the primary effect of increasing the relative proportion of the Native Shrubland VSG in the VMA by about 177%. Most of the effects would occur in the Wyoming Sagebrush Steppe PNVG. Treatments would move vegetation from the Non-Native Perennial, Non-Native Understory, and Native Grassland VSGs to the Native Shrubland VSG, resulting in a shift from communities dominated by uncharacteristic and early-successional vegetation to mid-successional vegetation. This would ultimately result in a larger proportion of the VMA being occupied by plant communities with a greater level of species diversity and structural complexity. Although Alternative VI allows for natural succession of shrubs in the Native Grassland VSG, it is unlikely this would result in a change in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. It is also unlikely that any of the treated acres would reach shrub cover exceeding 25% in less than 40 years (LANDFIRE, 2007). Alternative VI allows for assisted succession of native shrubland communities by introducing forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatments would affect relative proportions of these successional stages within VMA C. While natural succession of shrubs would occur in untreated existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities and forbs to non-native understory communities would contribute additional complexity at a community level.

VMA D

Alternative VI would convert a portion of the Annual VSG, reducing the potential for spread of invasive annual vegetation. Alternative VI for VMA D would have the primary effect of increasing the structural complexity of native grassland communities by adding a shrub component and increasing the relative proportion of the Native Shrubland VSG by 53%. This would reduce the relative proportion of herbaceous-dominated early-successional communities by 49%, with an increase in shrub-dominated mid-successional communities of 340%. The increased elevation in VMA D may translate to higher effective precipitation and greater potential for community diversity (Goodrich, 2005). Unassisted succession from one successional stage to another would be dependent on the type of plant community (LANDFIRE, 2007) and the presence of seed sources. Allowance for natural succession of shrubs would result in small shifts in the relative proportions of Native Grassland and Native Shrubland VSGs over the life of the plan. Alternative VI also allows for diversification of native shrubland communities to introduce forbs and late-successional grasses to the understory. These understory treatments would enhance the complexity of mid- or late-successional communities, but it is unlikely that treatment would affect relative proportions of these successional stages. While natural succession of shrubs would occur in untreated existing non-native perennial communities, this process would be inhibited due to competition from non-native perennial grasses (Cox and Anderson, 2004; Stevens and Monsen, 2004). Treatments to add shrubs to non-native perennial communities and forbs to non-native understory communities would contribute additional complexity at a community level.

Impacts from Noxious Weeds and Invasive Plants Actions

The following indicator was used to analyze the impacts of Noxious Weeds and Invasive Plants actions on upland vegetation:

- Potential for introduction and spread of noxious weeds and invasive plants.

Introduction and spread of noxious weeds and invasive plants into upland vegetation communities impacts native plant community composition and function. Many noxious weeds and invasive plants are known to displace native plants and disrupt the structure and function of local ecosystems (Vitousek, 1990). As noxious weed populations increase in size and frequency, they tend to reduce species diversity of surrounding native plant communities, altering the composition and community structure. As noxious weed and invasive plant populations are reduced, native vegetation is expected to increase in terms of acreage, cover, and diversity. Actions related to noxious weeds would not likely result in changes in vegetation between vegetation sub-groups (VSGs) or in native plant community successional stages.

Management actions related to invasive plants would convert acreages from the Annual VSG to a native community or Non-Native Perennial VSG. Where invasive plants are dominant, management actions that would result in this type of conversion are analyzed under *Impacts from Upland Vegetation Actions*. Where invasive plants are not dominant, management actions would not result in conversion of treated acreages from one VSG to another or change native community successional stages. Since existing acreages of noxious weeds are not currently mapped, effects of treatments of noxious weeds and invasive plants are addressed in the context of risk of invasion or spread and potential for control or eradication.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative provides no objectives or prioritizations for inventory or control of noxious weeds and invasive plants. It is unlikely that the No Action Alternative would reduce the potential for introduction or spread of noxious weeds and invasive plants. Occupied acreages and diversity of noxious weeds and invasive plants would likely continue to increase within the planning area. Relative proportion of annual-dominated communities would be expected to decrease slightly due to vegetation treatments in the No Action Alternative (see *Impacts from Upland Vegetation Actions*).

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide for inventory, integrated weed management control, and incorporation of best management practices (BMPs) and stipulations into BLM management activities, authorized uses, permits, and leases to limit introduction and spread of noxious weeds and invasive plants. Inventory would quantify existing conditions and provide a baseline for evaluation of risk for new invasions and spread of existing populations. An up-to-date inventory would also provide a basis for treatment prioritization. Prioritization, cooperative treatment, and incorporation of BMPs and stipulations would reduce the risk of invasion and spread. Ultimately these actions would reduce the potential for community- or landscape-level fragmentation due to introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative I

Alternative I would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 50,000 acres (3%) to meet objectives for noxious weeds and invasive plants. Management actions would reduce the risk of noxious weed and invasive plant introduction and spread by focusing treatments in high-disturbance areas (e.g., motorized and recreational access points, roadsides). Treatments in special designation areas, riparian areas, special status species habitat, mule deer winter range, and native plant communities would maintain or improve vegetation community or habitat quality. Achievement of objectives to reduce the cover of invasive plants would decrease the potential for type conversion of native plant communities from perennial to annual dominated communities.

Impacts from Management Specific to Alternative II

Alternative II would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 50,000 acres (3%) to meet objectives for noxious weeds and invasive plants. Management actions would reduce the risk of noxious and invasive plant introduction and spread, but do not prioritize treatments in areas where potential for introduction is high. Therefore, the introduction and spread of noxious weeds and invasive plants would occur in the vicinity of roads, motorized and recreational access points, and other high-disturbance areas. Fewer management options compared to Alternatives I, III, and V would contribute to increased potential for introduction and spread. Since thresholds described by the Alternative II objectives to reduce cover of invasive plants are higher than for the other alternatives, the risk of spread in both native and non-native communities would be greater. This would increase the potential for conversion of perennial communities to annual.

Impacts from Management Specific to Alternative III

Alternative III would treat about 200,000 acres (15%) of the planning area to prevent spread of noxious weeds and invasive plants. Alternative III would make the least progress of all the alternatives towards reduction or eradication of noxious weeds, as it prescribes the lowest level of treatment and focuses primarily on fuels reduction. Management actions would reduce risk of noxious and invasive plant spread by prioritizing treatments in areas with high potential for introductions to occur (e.g., fuel breaks, areas

with high wildland fire occurrence, roadsides). Achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual.

Impacts from Management Specific to Alternative IV

Alternative IV would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 250,000 acres (18%) to meet objectives for noxious weeds and invasive plants. Alternative IV would reduce the risk of noxious and invasive plant introduction and spread, but does not prioritize treatments in areas where potential for introduction is high. Therefore, the introduction and spread of noxious weeds and invasive plants would occur in the vicinity of roads, motorized and recreational access points, or other high-disturbance areas. Fewer management options compared to Alternatives I, III, and V would contribute to increased potential for introduction and spread. However, based on stated objectives and projected treatment acres, Alternative IV would make the greatest progress of all the alternatives towards eradication of noxious weeds. Treatments in special designation areas, riparian areas, special status species habitat, and native plant communities would maintain or improve vegetation community or habitat quality. Achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Management Specific to Alternative V

Alternative V would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 100,000 acres (7%) to meet objectives for noxious weeds and invasive plants. Alternative V would reduce the risk of noxious and invasive plant introduction and spread, but would not prioritize treatments in areas where potential for introduction is high. Therefore, the introduction and spread of noxious weeds and invasive plants would occur in the vicinity of roads, motorized and recreational access points, or other high-disturbance areas. Management activities would contribute to decreased potential for introduction and spread. Based on stated objectives, Alternative V would make intermediate progress towards eradication of noxious weeds. Treatments in special designation areas, riparian areas, special status species habitat, and native plant communities would maintain or improve vegetation community and habitat quality. Achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would treat about 200,000 acres (15%) of the planning area to prevent spread of noxious weeds and invasive plants. Management actions would reduce the risk of noxious and invasive plant introduction and spread by focusing treatments in high-disturbance areas (e.g., motorized and recreational access points, roadsides). Treatments in special designation areas, riparian areas, special status species habitat, and native plant communities would maintain or improve vegetation community and habitat quality. Achievement of objectives to reduce the cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on upland vegetation:

- Composition of each Vegetation Management Area (VMA) and the planning area by vegetation sub-group (VSG),
- Composition of each VMA and the planning area by successional stage, and
- Potential for introduction and spread of noxious weeds and invasive plants.

Wildland fire is an episodic event and can result in short- or long-term conversion of acres from one VSG or successional stage to another. The effects of wildland fire are dependent on multiple factors including the type of existing vegetation, fire severity, fire size and continuity, time and frequency of previous disturbance, and post-fire weather. Four types of wildland fire management actions were analyzed for their potential to impact upland vegetation communities: wildland fire suppression priorities, wildland fire suppression actions, emergency stabilization and burned area rehabilitation (ES&BAR) actions, and fuels treatment actions.

Fire suppression priorities have been identified for each alternative. Locations within the planning area are designated as either critical or conditional suppression areas, depending on resource management priorities. Additional priorities have been identified to guide wildland fire suppression in the case of multiple starts. Areas identified for critical suppression would tend to have smaller fire sizes than conditional suppression areas and are less likely to experience a change in VSG or successional stage due to wildland fire.

Fire suppression actions would result in removal of vegetation through blading, cutting, or burning. These result in localized disturbances that would be small in scale from a landscape perspective and might be restricted for resource protection. However, they would cause soil surface disturbance that creates physical openings in communities for noxious weeds or invasive plants. Use of fire retardant can result in short-term increases in nitrogen and phosphorus. This can affect vegetation community composition by creating conditions favorable for growth of annual plants (Larson and Duncan, 1982).

ES&BAR actions performed within three years of a wildland fire can assist natural revegetation through protection of the burned area or result in changes in VSGs through treatments including seeding and planting of native or non-native vegetation.

Fuels treatment actions modify vegetation community composition and structure to reduce the potential for fire spread. Fuels treatment actions are normally applied to manage vegetation and other resources including the wildland urban interface (WUI), cultural sites, and wildlife and special status species habitat. Fuel breaks create linear disturbances that can facilitate introduction of noxious weeds and invasive plants (Merriam et al., 2006). These disturbances would be short-term for the establishment of vegetated fuel breaks but long-term for the establishment and maintenance of unvegetated fuel breaks.

The effects of wildland fire ecology and management actions on upland vegetation communities were assessed based on suppression priorities and protective measures such as fuel breaks. Suppression priorities were evaluated to determine which VSGs would likely have higher priority and what proportion of priority VSGs would be protected over the planning area and within the VMAs.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, the planning area is under full suppression. The No Action Alternative does not prioritize wildland fire suppression activities. Lack of prioritization reduces the potential for critical resource needs to be identified and acted on in the event of multiple starts. Therefore, there is a higher potential for loss of native shrubland communities under the No Action Alternative as compared to the action alternatives. There is also greater potential that areas treated to restore native communities or to stabilize and rehabilitate areas under ES&BAR would burn or re-burn before becoming fully established and this results in greater potential for the introduction and spread of noxious weeds and invasive plants. The No Action Alternative would perpetuate the current trend of loss of shrubland communities and maintenance of the landscape in annual, non-native perennial, and early-successional native communities.

Impacts from Management Common to All Action Alternatives

The goal common to all action alternatives for wildland fire management is to create wildland fire management strategies that would result in firefighter and public safety and protection of property and natural and cultural resources, while considering suppression and rehabilitation costs. These actions provide for direction relative to appropriate management response for critical and conditional suppression areas. While these actions would have no specific effect on upland vegetation, they provide a framework in the case of wildland fire to reduce the potential for resource loss. The goal common to all action alternatives for fuels and ES&BAR is to reduce wildland fire hazard within the WUI. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Effects of these actions on upland vegetation are primarily through direction for vegetation treatments and rest from uses following treatment. This direction would have the primary effect of increasing the potential for short- and long-term success of vegetation treatments.

Impacts from Management Specific to Alternative I

Alternative I identifies 491,000 acres (36% of the planning area) as critical suppression areas with priorities in the WUI; the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, and Salmon Falls Creek Areas of Critical Environmental Concern (ACECs); and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities for Alternative I, priority VSGs would be Native Grassland and Native Shrubland.

In the case of multiple ignitions, critical suppression areas are prioritized by VMA in the following order:

- VMA C (101,000 acres in critical suppression areas; 32% of VMA C),
- VMA B (206,000 acres in critical suppression areas; 33% of VMA B),
- VMA D (135,000 acres in critical suppression areas; 65% of VMA D), and
- VMA A (49,000 acres in critical suppression areas; 22% of VMA A).

Wildland fire management priorities for critical suppression would not fully protect native grassland and shrubland communities within the planning area or in the highest priority VMAs. Native grassland would be relatively resilient if burned; burning of native grassland communities would facilitate conversion to native shrublands through post-fire treatments to seed or plant shrubs. Protection of key sage-grouse habitat would prioritize suppression resources for native shrubland communities and would reduce the potential for loss in the case of multiple ignitions. Allowing wildland fire to burn annual and non-native perennial communities within the perimeter of an active wildland fire would facilitate restoration of these communities to native shrubland. Fuel breaks placed to protect restoration and ES&BAR treatments would enhance the potential for treatment success and lessen the potential need for re-treatment due to subsequent wildland fire. However, fuel breaks also create linear disturbances that can facilitate introduction of noxious weeds and invasive plants (Merriam et al., 2006). These disturbances would be short-term for the establishment of vegetated fuel breaks.

Table 4-93. Percent of Priority Vegetation Sub-Groups in Critical Suppression Areas by Vegetation Management Area Priority in Alternative I

Area	Priority VSG Protected (Baseline)	Priority VSG Protected following Implementation of Upland Vegetation Treatments
Planning Area	46	41
VMA C	36	31
VMA B	46	40
VMA D	64	68
VMA A	22	17

Fire management priorities would not protect all native grassland and shrubland communities resulting from implementation of vegetation treatments, particularly in VMAs C and B. These VMAs would likely continue to experience loss of native shrublands due to wildland fire.

Impacts from Management Specific to Alternative II

Alternative II identifies 170,000 acres (12% of the planning area) as critical suppression areas with priorities in the WUI. Unburned patches of native and non-native perennial communities within the perimeter of an active wildland fire would be protected, while unburned annual communities would be allowed to burn. Based on suppression priorities in Alternative II, priority VSGs would be Native Grassland and Non-Native Perennial.

In the case of multiple ignitions, critical suppression areas are prioritized by VMA in the following order:

- VMA A (46,000 acres in critical suppression areas; 21% of VMA A),
- VMA B (55,000 acres in critical suppression areas; 9% of VMA B),
- VMA D (50,000 acres in critical suppression areas; 24% of VMA D), and

- VMA C (19,000 acres in critical suppression areas; 6% of VMA C).

Fire management priorities provide low levels of protection outside of the WUI in all VMAs. Priority VSGs contain native and non-native perennial grasslands, which would be relatively resilient if burned. Critical suppression priorities do not extend to either native shrubland or non-native understory communities under Alternative II; therefore, it is likely that acres occupied by shrubland communities would decrease over the life of the plan. Seeding of shrubs into burned native grassland and native shrubland communities would be employed under ES&BAR, which would balance loss to wildland fire. However, protection priority would likely maintain native communities in early-successional condition due to high potential for re-burning. Allowing wildland fire to burn annual communities within the perimeter of an active wildland fire would facilitate conversion of these communities to non-native perennial. Actions to improve protection of native communities (e.g., fuel breaks placed in non-native communities to protect native communities and improvement of water availability for suppression) would reduce loss of native shrublands, depending on location of wildland fires and whether there are concurrent incidents of higher priority. The potential for the introduction and spread of noxious weeds and invasive plants is the same as Alternative I.

Table 4-94. Percent of Priority Vegetation Sub-Groups in Critical Suppression Areas by Vegetation Management Area Priority in Alternative II

Area	Priority VSG Protected (Baseline)	Priority VSG Protected following Implementation of Upland Vegetation Treatments
Planning Area	9	8
VMA A	14	10
VMA B	7	7
VMA D	23	20
VMA C	3	3

Impacts from Management Specific to Alternative III

Alternative III identifies 476,000 acres (35% of the planning area) as critical suppression areas with priorities in the WUI, the Bruneau-Jarbidge and Salmon Falls Creek ACECs, and key sage-grouse habitat. Unburned patches of native and non-native perennial communities within the perimeter of an active wildland fire would be protected, while unburned annual communities would be allowed to burn. Based on suppression priorities in Alternative III, priority VSGs would be Native Shrubland (key sage-grouse habitat), Native Grassland, and Non-Native Perennial.

In the case of multiple ignitions, critical suppression areas are prioritized by VMA in the following order:

- VMA B (204,000 acres in critical suppression areas; 32% of VMA B),
- VMA A (47,000 acres in critical suppression areas; 21% of VMA A),
- VMA C (100,000 acres in critical suppression areas; 32% of VMA C), and
- VMA D (125,000 acres in critical suppression areas; 60% of VMA D).

Fire management priorities for critical suppression would not fully protect native shrubland, native grassland and non-native perennial communities within the planning area or in the highest priority VMAs. Native grassland and non-native perennial communities would be relatively resilient if burned. Burning would facilitate establishment of shrubs in native grassland communities to break up fuel continuity in VMAs B, C, and D through post-fire treatments, although the potential for re-burning, particularly in VMA C, would be relatively high. Protection of key sage-grouse habitat would prioritize suppression resources for native shrubland communities and would reduce the potential for loss in the case of multiple ignitions. Allowing wildland fire to burn in annual communities within the perimeter of an active wildland fire would facilitate conversion of these communities to non-native perennial in VMAs A and B and native grassland in VMA D. Alternative III contains the largest network of fuel breaks, placed in strategic locations to disrupt continuity of fuels and to protect resources such as sage-grouse and slickspot peppergrass habitat. This action would break up fuel continuity on the landscape, but would also result in spatial

fragmentation of contiguous blocks of native shrubland vegetation. In addition, fuel breaks create linear disturbances that can facilitate introduction of noxious weeds and invasive plants (Merriam et al., 2006). These disturbances would be short-term for the establishment of vegetated fuel breaks but long-term for the establishment and maintenance of unvegetated fuel breaks.

Table 4-95. Percent of Priority Vegetation Sub-Groups in Critical Suppression Areas by Vegetation Management Area Priority in Alternative III

Area	Priority VSG Protected (Baseline)	Priority VSG Protected following Implementation of Upland Vegetation Treatments
Planning Area	46	45
VMA B	47	45
VMA A	20	16
VMA C	36	36
VMA D	61	60

Impacts from Management Specific to Alternative IV

Alternative IV-A identifies 594,000 acres (43% of the planning area) and Alternative IV-B identifies 552,000 acres (40% of the planning area) as critical suppression areas with priorities in the WUI; the Bruneau-Jarbidge, Inside Desert, Jarbidge Foothills, and Lower Bruneau Canyon ACECs; and key sage-grouse habitat. Based on suppression priorities in Alternative IV, priority VSGs would be Native Grassland and Native Shrubland.

In the case of multiple ignitions, critical suppression areas are prioritized by VMA in the following order:

- VMA C (150,000 acres in critical suppression areas or 48% of VMA C in Alternative IV-A; 137,000 acres or 44% of VMA C in Alternative IV-B),
- VMA D (160,000 acres in critical suppression areas or 77% of VMA D in Alternative IV-A; 143,000 acres or 69% of VMA D in Alternative IV-B),
- VMA B (235,000 acres in critical suppression areas or 37% of VMA B in Alternative IV-A; 223,000 acres or 35% of VMA B in Alternative IV-B), and
- VMA A (49,000 acres in critical suppression areas or 22% of VMA A in Alternatives IV-A and IV-B).

Fire management priorities under Alternatives IV-A and IV-B would be similar, with the exception of reduced critical suppression acreages in the Inside Desert and Jarbidge Foothills ACECs in Alternative IV-B. Fire management priorities for critical suppression would not fully protect native grassland and shrubland communities within the planning area or in the highest priority VMAs. Native grassland would be relatively resilient if burned; burning of native grassland communities would facilitate conversion to native shrublands through post-fire treatments that seed or plant shrubs. Allowing wildland fire to burn annual and non-native perennial communities within the perimeter of an active wildland fire would facilitate conversion of these communities to native through application of post-fire ES&BAR or restoration treatments. Protection of key sage-grouse habitat would prioritize suppression resources for native shrubland communities and would reduce the potential for loss in the case of multiple ignitions. As other VSGs are converted to native shrubland, the potential for protecting all native shrubland communities would be reduced; therefore, it is likely that these communities would revert to native grassland in areas with a lower suppression priority, such as VMA A. Fuel breaks placed to protect restoration and ES&BAR treatments would enhance the potential for treatment success and lessen the potential need for re-treatment due to subsequent wildland fire. The potential for the introduction and spread of noxious weeds and invasive plants is the same as Alternative I, but would be reduced as native vegetation communities are established.

Table 4-96. Percent of Priority Vegetation Sub-Groups in Critical Suppression Areas by Vegetation Management Area Priority in Alternative IV

Area	Priority VSG protected (Baseline)	Priority VSG Protected following Implementation of Upland Vegetation Treatments
Alternative IV-A		
Planning Area	53	42
VMA C	46	40
VMA D	76	70
VMA B	50	40
VMA A	22	11
Alternative IV-B		
Planning Area	50	40
VMA C	44	39
VMA D	67	62
VMA B	49	39
VMA A	22	11

Impacts from Management Specific to Alternative V

Alternative V identifies 1,041,000 acres (76% of the planning area) as critical suppression areas with priorities in the WUI; the Lower Bruneau Canyon, Middle Snake, and Sagebrush Sea ACECs; and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative V, priority VSGs would be Native Grassland and Native Shrubland.

In the case of multiple ignitions, critical suppression areas are prioritized by VMA in the following order:

- VMA C (313,000 acres in critical suppression areas; 100% of VMA C),
- VMA B (473,000 acres in critical suppression areas; 75% of VMA B),
- VMA D (207,000 acres in critical suppression areas; 100% of VMA D), and
- VMA A (47,000 acres in critical suppression areas; 21% of VMA A).

Fire management priorities for critical suppression would protect native grassland and shrubland communities throughout the planning area. However, due to the majority of the planning area being a critical suppression area the potential for critical resource needs to be identified and acted on in the event of multiple starts is reduced. Therefore, there is a higher potential for loss of native shrubland communities under Alternative V as compared to alternatives I, III, IV, and VI. There is also greater potential that areas treated to restore native communities or to stabilize and rehabilitate areas under ES&BAR would burn or re-burn before becoming fully established. Allowing wildland fire to burn annual and non-native perennial communities within the perimeter of an active wildland fire would facilitate conversion of these communities to native through application of post-fire ES&BAR or restoration treatments. This would likely occur in VMA A. In VMAs B, C, and D, there would be less opportunity for vegetation treatments following wildland fire; therefore, Alternative V would require more use of prescribed fire in these VMAs to achieve vegetation objectives. Placement of shrubs to break up fine fuels in non-native perennial and native grassland communities would help reduce fire spread. Fuel breaks placed along roads would increase fragmentation of vegetation patches, by increasing the width of disturbance and the associated potential for invasion by noxious weeds or invasive vegetation (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003; Merriam et al., 2006) (see *Impacts from Transportation and Travel Actions*).

Table 4-97. Percent of Priority Vegetation Sub-Groups in Critical Suppression Areas by Vegetation Management Area Priority in Alternative V

	% of priority VSG protected (baseline)	% of priority VSG protected following implementation of upland vegetation treatments
Planning Area	88	88
VMA C	100	100
VMA B	82	82
VMA D	100	100
VMA A	20	16

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI identifies 597,000 acres (44% of the planning area) as critical suppression areas with priorities in the WUI; the Lower Bruneau Canyon, Sandpoint, Upper Bruneau Canyon, and Salmon Falls Creek ACECs; Saylor Creek Herd Management Area; occupied habitat for slickspot peppergrass; critical habitat for bull trout; and the sage-grouse management area. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative VI, priority VSGs would be Native Grassland and Native Shrubland.

In the case of multiple ignitions, critical suppression areas are prioritized by VMA in the following order:

- VMA C (123,000 acres in critical suppression areas; 39% of VMA C),
- VMA B (202,000 acres in critical suppression areas; 32% of VMA B),
- VMA D (134,000 acres in critical suppression areas; 65% of VMA D), and
- VMA A (137,000 acres in critical suppression areas; 62% of VMA A).

Fire management priorities for critical suppression under Alternative VI would protect native grassland and shrubland communities throughout the planning area. Allowing wildland fire to burn annual and non-native perennial communities within the perimeter of an active wildland fire would facilitate conversion of these communities to native through application of post-fire ES&BAR or restoration treatments. This would likely occur in VMA A. In VMAs B, C, and D, there would be less opportunity for vegetation treatments following wildland fire; therefore, Alternative VI would require more use of prescribed fire in these VMAs to achieve vegetation objectives. Protection of the sage-grouse management area would prioritize suppression resources for native shrubland communities and would reduce the potential for loss in the case of multiple ignitions. As other VSGs are converted to native shrubland, the potential for protection of all native shrubland communities would be reduced; therefore, it is likely that these communities would revert to native grassland areas with a lower suppression priority, such as VMA A. Fuel breaks placed to protect restoration and ES&BAR treatments would enhance the potential for treatment success and lessen the potential need for re-treatment due to subsequent wildland fire. The potential for the introduction and spread of noxious weeds and invasive plants is the same as Alternative I, but would be reduced as native vegetation communities are established.

Table 4-98. Percent of Priority Vegetation Sub-Groups in Critical Suppression Areas by Vegetation Management Area Priority in Alternative VI (Proposed RMP)

Area	Priority VSG Protected (Baseline)	Priority VSG Protected following Implementation of Upland Vegetation Treatments
Planning Area	48	47
VMA B	45	43
VMA A	53	49
VMA C	39	39
VMA D	64	64

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on upland vegetation:

- Composition of each Vegetation Management Area (VMA) and the planning area by vegetation sub-group (VSG),
- Composition of each VMA and the planning area by successional stage, and
- Potential for introduction and spread of noxious weeds and invasive plants.

The sagebrush steppe communities, such as those that historically dominated the planning area, did not evolve with large herds of grazing ungulates such as bison (Mack and Thompson, 1982); herbaceous plants and biological soil crusts that inhabit the sagebrush steppe did not evolve with grazing systems that concentrate animal use during critical growing periods. Rather, grazing by native ungulates is characterized by smaller groups of animals that utilize shrubs for browse, as well as grass and forbs, and seasonal elevational migrations that extend the periods of food availability (Platou and Tueller, 1985).

Livestock grazing can alter herbaceous cover and may influence species composition and structure of upland vegetation communities (Saab et al., 1995). The type and intensity of effects depend on factors such as type of livestock and grazing system used including stocking rate, season of use, use levels, and location and density of livestock facilities (e.g., fences, water, salt). The effects can be due to consumption or trampling and can be direct (e.g., removal of vegetation, trampling plants) or indirect (e.g., soil compaction). Trampling is the most common disturbance caused by grazing animals to biological soil crust. This trampling causes mechanical damage and burial of crusts that results in a reduction of crust cover (Belnap and Eldridge, 2001).

Vegetation allocations for livestock grazing in the alternatives are based on vegetation production. The range of percentages allocated would be constant over the life of the plan; the specific number of animal unit months (AUMs) allocated would change dependent on production.

Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management encourage grazing management practices that maintain or improve native plant populations, wildlife habitats in native plant communities, and structural diversity and production in seeded areas (BLM, 1997). Livestock grazing actions were evaluated on the potential to maintain or improve plant community species diversity and structural complexity. Impacts from specific actions, including the assignment of grazing systems and forage allocations on an allotment level, would be addressed in implementation-level plans.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 1,412,000 acres (97%) of the planning area would be available for livestock grazing and 51,000 acres (3%) would be unavailable. Areas unavailable for livestock grazing are not specifically identified for vegetation treatments. Livestock exclusion would not likely result in short-term changes in VSG or native community successional stages and would have negligible effects to upland vegetation at the scale of the VMAs or planning area.

Locally in the ungrazed areas, long-term exclusion of grazing from native plant communities would eventually result in increased plant cover, species diversity, and structural complexity (Anderson and Inouye, 2001). Exclusion of non-native perennial communities would likely result in greater cover of perennial plants; diversification of these communities would depend on residual seed banks and proximity to native seed sources (Marlette and Anderson, 1986; Yeo, 2005). Exclusion of grazing is expected to have long-term results of increased cover and complexity of biological soil crusts (Ponzetti and McCune, 2001; Warren and Eldridge, 2001). However, the extent and timing of recovery for all formerly grazed communities depends on several factors including species composition at the time of exclusion (including biological crusts), residual seed bank, proximity to propagule sources, and precipitation (Anderson and Inouye, 2001; Belnap and Eldridge, 2001; Hilty et al., 2004; Marlette and Anderson, 1986). Grazing exclusion in areas dominated by annual communities would result in short- or long-term change in VSG. Mechanisms for perpetuation of the Annual VSG under grazing exclusion include short fire return intervals that inhibit recovery of perennial grasses and shrubs (Chambers et al., 2007; Laycock, 1991),

and modification of litter type and distribution as well as soil physical and biological properties to favor cheatgrass (Belnap and Phillips, 2001; Belnap et al., 2005; Evans et al., 2001). Grazing exclusion would result in long-term increase of on-site native perennial species. Potential for improvement would be dependent on several factors including the amount of residual perennial vegetation and climatic patterns (e.g., drought) that might favor suppression of annuals (Laycock, 1991; West and Yorks, 2002).

Under the No Action Alternative, vegetation allocations would remain as current; with successful vegetation treatments increased herbaceous forage would become available which would increase AUMs. Objectives for the No Action Alternative are: to design and establish grazing management practices to meet fisheries, riparian, and water quality needs; to recognize the physiological requirements of forbs and shrubs; and insure the habitat requirements for wildlife are met. Since vegetation treatments focus on perennial grass production and objectives focus on protection of forbs and shrubs, it is assumed that most allocation for livestock would focus on use of annual and perennial grass production. Due to the lack of actions regarding variable and minimal residual heights for wildlife habitat needs and utilization criteria, it is expected that residual herbaceous height would be relatively uniform with minimum height near water sources. Authorization of temporary non-renewable (TNR) permits would prolong grazing seasons and promote uniform use. These actions would promote short-stature native early- and mid-successional grasses, such as Sandberg bluegrass and bottlebrush squirreltail, and non-native perennial grasses.

Increases in miles of pipelines and fences and numbers of reservoirs, wells, and spring developments would result in increased density of linear disturbance and disturbed areas radiating from watering points. Installation and maintenance of pipelines results in linear disturbance from burial and, unless pipelines are installed along existing roads, formation of primitive roads. This can create conduits for noxious weeds and invasive plants and would result in modification of native plant community species composition (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003). Likewise, construction and maintenance of fences can have similar effects. Fence construction does not result in the same degree of soil disturbance as pipeline construction, but primitive roads often form on one or both sides of the fence due to maintenance and other uses. Repeated livestock travel along fences can also create linear disturbances that may be vulnerable to noxious weed and invasive plant introduction.

Construction, installation, and maintenance of watering facilities including reservoirs, wells, troughs, and spring developments can result in both linear disturbance corridors due to access needs, and a zone of disturbance that radiates out from the watering location (Brooks et al., 2006; Lange, 1969; Rogers and Lange, 1971). The size of the impacted area depends on levels and consistency of use, but complete removal of vegetation can occur within a 50 to 100-foot radius of a watering site. Effects resulting from high use can radiate for several hundred feet from a watering site and can include removal of herbaceous cover, damage to shrubs from trampling, and invasion and spread of noxious weeds and invasive plants (Brooks et al., 2006; Vallentine, 2001). Similar effects can be found at locations where salt or supplements are offered.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction and design criteria for implementation-level planning to reduce resource impacts. These actions would not result in short- or long-term changes in VSG or native community successional stages, but would help maintain or improve plant community species diversity, structural complexity, and ecological function.

Impacts from Management Specific to Alternative I

Under Alternative I, 1,389,000 acres (95%) of the planning area would be available for livestock grazing and 74,000 acres (5%) would be unavailable. Areas unavailable for grazing would be restored from annual communities to native shrubland. The Deadman/Yahoo Special Recreation Management Area would be treated to convert annual communities to native grassland and non-native perennial communities. These areas occur within VMAs A and B and include some of the driest sites in the planning area. Because restoration treatments can be slow to establish in low precipitation zones, potential for success of restoration treatments in these areas and long-term maintenance of restored native shrubland would be increased through minimizing effects associated with livestock trampling and

grazing (Stevens, 2004). Long-term effects of livestock exclusion would be the same as described for the No Action Alternative.

Allocation of more than 60% of vegetation production for native and non-native perennial grass, shrub, and forb production to watershed and wildlife would promote landscape stability due to retention of plant biomass and structure (Pellant et al., 2005). Diversification of species composition and community structure would occur in native plant communities; however, the extent of natural diversification would depend on the presence of native plants and growing conditions such as precipitation and competition with exotic annuals (Anderson and Inouye, 2001). Annual grass production is unpredictable and highly variable (Vallentine and Stevens, 1994). Allocation of annual grass production to livestock would result in greater use of perennial grasses in years when annual grass production is low, resulting in over-allocation of perennial forage. This would result in reduced perennial cover and increased susceptibility for dominance by annual grasses (Blaisdell and Pechanec, 1949; Chambers et al., 2007).

Likewise, targeted grazing treatments would be used to reduce fine fuels and other undesirable vegetation such as noxious weeds or invasive plants or reduce biomass to meet management goals (Launchbaugh et al., 2008; Olson and Wallander, 1998).Targeted grazing would be applied to vegetated fuel breaks or adjacent to areas identified for protection including restoration and emergency stabilization and burned area rehabilitation (ES&BAR) treatments. The effectiveness of targeted grazing would be temporary and localized (Launchbaugh et al., 2008; Vallentine and Stevens, 1994) and, because of the late spring/early summer timing, would potentially reduce vigor of perennial grasses (Pellant, 1990). This treatment would be best suited for use in areas dominated by grazing tolerant non-native perennial or invasive annual grasses as opposed to native grasses (Meays et al., 2000). Targeted grazing in areas dominated by invasive annuals would need to be combined with other treatments (e.g., chemical, seeding with perennial plants) for long-term success (Hempy-Mayer and Pyke, 2008).

Estimated utilization levels to achieve resource and use objectives of 30% to 40% for native communities and 40% to 50% for non-native communities are generally considered to be of moderate intensity (Holechek, 1988; Holechek et al., 1998). Utilization at the upper end of the ranges would tend to keep vegetation conditions static; consistent utilization at the lower end of the ranges or below would be required for improvement (Holechek et al., 1999). Biological soil crusts are more sensitive to livestock disturbance than vascular plants and would likely be more abundant and diverse in native communities with lower utilization (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic heavy use (i.e., up to 70% every five years) in non-native communities would reduce competition from perennial grasses and increase shrubby vegetation (Beck and Mitchell, 2000). However, this short-term, high-intensity use would also weaken remnant native plants and result in short-term increased potential for introduction of noxious weeds and invasive plants (Chambers et al., 2007; Ellison, 1960).

Implementation of actions to provide adequate protective cover for nesting sage-grouse and other ground-nesting birds would provide a moderate level of protection for herbaceous plant vigor in non-native understory and native plant communities through establishment of residual heights within time frames that coincide with critical growing periods for plants, between approximately March 1 and May 1. Due to low residual heights (i.e., four inches) these actions would promote low-stature, early- and mid-successional grasses such as Sandberg bluegrass and bottlebrush squirreltail. Additional protections for big game breeding habitats and aspen would promote maintenance of mid- and late-successional stages in native shrublands, primarily in VMAs C and D. Compliance with best management practices (BMPs) for livestock grazing in upland areas (Appendix B) would help maintain or improve diversity and structure in native plant communities by retaining adequate cover for breeding sage-grouse, special status birds, and big game and placing salt and other supplements to minimize congregation of livestock in native communities. Winter use (i.e., December through March) of native shrubland by livestock would result in reduced vigor of herbaceous plants due to removal of standing dead biomass that might provide protection from light and increased available moisture due to snow entrapment (Merrill et al., 1994; Sauer, 1978; Willms and Chanasyk, 2006).

Use of TNR permits in pastures with less than 50% big game winter range or native plant communities, excluding Sandberg bluegrass/non-native areas, would extend the grazing season and would potentially result in more uniform utilization of perennial grasses. While utilization standards would apply, this would

reduce structural complexity in native patches, non-native perennial, and non-native understory communities until regrowth occurs.

The number, type, and density of range infrastructure developments under Alternative I would be similar to the No Action Alternative; however locations would be modified to meet resource objectives. Potential for introduction of noxious weeds and/or invasive plants would be reduced by application of BMPs (Appendix B).

Removal of fences would result in short-term disturbance due to access for removal of posts, wire, and other components. Long-term effects of fence removal to upland vegetation would be dependent on continued use of established primitive roads or trails by humans or livestock, but would include recovery of vegetation adjacent to the former fence line. Recovery would be facilitated by treatment of noxious weeds or invasive plants where present.

Impacts from Management Specific to Alternative II

Under Alternative II, 1,408,000 acres (96%) of the planning area would be available for livestock grazing and 55,000 acres (4%) would be unavailable. Areas unavailable for livestock grazing are not specifically identified for vegetation treatments. The effects of livestock grazing exclusion would be the same as those described for the No Action Alternative.

Vegetation allocations would tend to promote retention of shrub and forb biomass. High allocation of annual grass production would provide substantial forage in years where growing conditions support annual grass production. However, this production is unpredictable (Vallentine and Stevens, 1994) and, as described for Alternative I, high allocation would result in over-use of perennial grasses in years when annual grasses are not abundant. This would result in reduced perennial cover and increased susceptibility for dominance by annual grasses (Blaisdell and Pechanec, 1949; Chambers et al., 2007). However, utilization limits for key species would limit the risk of repeated heavy grazing.

Estimated utilization levels to achieve resource objectives of 40% to 50% for native communities and 50% to 60% for non-native perennial communities are considered to be of moderate to high intensity (Holechek, 1988; Holechek et al., 1998). Utilization at the upper end of the ranges would tend to result in eventual degradation of plant communities; utilization at the lower end of the ranges would be necessary to maintain static conditions (Holechek et al., 1999). Biological soil crusts would be reduced in both cover and species abundance under moderate to high utilization (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic short-term heavy use (i.e., up to 70% every five years) would be used to stimulate plant production in perennial grass stands that have accumulated litter and is expected to have results similar to those described for Alternative I.

Management actions that provide residual cover for sage-grouse and other ground nesting birds would be limited to allotments with more than 50% native plant communities and native shrublands within one mile of occupied leks, and to the initiation of the nesting season. This would not provide variable residual cover in all native plant communities or potential habitat and would reduce impacts only during the onset of the growing season. Due to low residual heights (i.e., four inches), these actions would tend to promote short-statured, early- and mid-successional grasses such as Sandberg bluegrass and bottlebrush squirreltail. Alternative II would not promote maintenance of mid- and late-successional stages in native shrublands. The effects of compliance with BMPs for wildlife habitat and winter use would be similar to those described for Alternative I.

The designation of reserve common allotments would provide flexibility for post-wildland fire rest of burned areas, post-treatment rest of ES&BAR, and post-treatment rest of vegetation treatments. The ability to provide post-disturbance rest would improve upland vegetation recovery or seeding establishment, particularly in cases where two growing seasons is not an adequate rest period.

The effects of TNR permits, targeted grazing, and the installation, construction, and maintenance of grazing facilities would be similar to those described for Alternative I. The number and density of all types of range infrastructure developments under Alternative II would increase compared to the No Action

Alternative to accommodate increased allocations. Locations of existing facilities would be modified to meet resource objectives.

Impacts from Management Specific to Alternative III

Under Alternative III, 1,407,000 acres (96%) of the planning area would be available for livestock grazing and 56,000 acres (4%) would be unavailable. Areas unavailable for livestock grazing are not specifically identified for vegetation treatments. The effects of livestock grazing exclusion would be the same as those described for the No Action Alternative.

The effects of allocations would be similar to those described for Alternative II. Estimated utilization levels for Alternative III are 30% to 40% for native communities and 50% to 60% for non-native perennial communities. The effects of estimated utilization levels on native communities would be similar to those described for Alternative I; the effects of proposed utilization levels on non-native communities would be similar to Alternative II. Management of upland vegetation for sage-grouse, other wildlife habitat, and aspen and the effects of winter use would be similar to those described for Alternative I. As in Alternative II, the management actions that provide residual cover for ground-nesting birds would be limited to allotments with more than 50% native plant communities and would not extend to all native plant communities or potential habitat.

The effects of reserve common allotments, TNR permits, targeted grazing, and the installation, construction, maintenance, and removal of grazing facilities would be similar to those described for Alternative I. The number and density of all types of range infrastructure developments under Alternative III would increase compared to the No Action Alternative to accommodate increased allocations. The potential for the introduction and spread of noxious weeds and invasive plants is greater than the No Action Alternative due to the increase in infrastructure. Locations of existing facilities would be modified to meet resource objectives.

Impacts from Management Specific to Alternative IV

Under Alternative IV-A, 1,324,000 acres (90%) of the planning area would be available for livestock grazing and 139,000 acres (10%) would be unavailable; under Alternative IV-B , 1,355,000 acres (93%) of the planning area would be available for livestock grazing and 108,000 acres (7%) would be unavailable. Livestock exclusion would include areas in the Inside Desert Area of Critical Environmental Concern (ACEC) identified for restoration of non-native perennial communities to native shrubland. The effects of livestock exclusion on restoration treatments would be similar to those described in Alternative I. The long-term effects of livestock exclusion would be similar to those described for the No Action Alternative, but would occur over larger and more contiguous areas.

Allocation of the majority of vegetation production, more than 70% for native and non-native perennial grass and all annual, shrub, and forb production, to watershed and wildlife would promote landscape stability due to retention of plant biomass and structure (Pellant et al., 2005). Diversification of species composition and community structure would occur in native plant communities; however, the extent of natural diversification would be dependent on the presence of native plants and growing conditions such as precipitation and competition with exotic annuals (Anderson and Inouye, 2001). Low allocation of native perennial grass and shrubs for livestock would support restoration goals to convert annual communities to native shrubland, particularly in VMAs A and B. Because restoration treatments can be slow to establish in low precipitation zones, the potential for success of restoration treatments in these areas and long-term maintenance of restored native shrubland would be increased through minimizing the effects associated with livestock trampling and grazing (Stevens, 2004). Lack of allocation of annual grass to livestock would reduce potential for over-use of perennial grasses in years of low annual grass production.

Estimated utilization levels to achieve resource objectives of 20% to 30% for native communities and 30% to 40% for non-native communities are generally considered to be of light intensity (Holechek, 1988; Holechek et al., 1998). Expected utilization within these ranges, particularly at the lower end of the ranges, would tend to result in improvement of vegetation community condition (Holechek et al., 1999) and reduce potential for invasion by noxious weeds and invasive plants (Chambers et al., 2007). The light

utilization levels under Alternative IV would promote greater cover and species abundance for biological soil crusts (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). The effects of habitat management actions and implementation of BMPs would be similar to Alternative I, except greater residual heights (i.e., seven inches) for late-successional grasses would be more favorable to retention of those species and greater structural diversity.

The effects of TNR permits would be similar to Alternative I; however, since TNR permits would not be allowed in pastures with greater than 25% native communities by cover, excluding Sandberg/non-native areas, the proportion of landscape affected would be less than in the No Action Alternative or Alternatives I, II, or III. Areas unavailable for TNR permits would increase with conversion of annual and non-native communities to native communities through vegetation treatment.

The effects of reserve common allotments would be similar to those described for Alternative II. The effects of TNR permits, targeted grazing, and the installation, construction, maintenance, and removal of grazing facilities would be similar to those described for Alternative I. The number and density of all types of range infrastructure developments would decrease under Alternative IV compared to the No Action Alternative due to decreased allocations. Locations of existing facilities would be modified to meet resource objectives.

Impacts from Management Specific to Alternative V

Under Alternative V, 1,160,000 acres (79%) of the planning area would be available for livestock grazing and 303,000 acres (21%) would be unavailable. This would include areas in the Lower Bruneau Canyon and Middle Snake ACECs identified for restoration of annual and non-native perennial communities to native shrubland and non-native understory. The effects of livestock exclusion on restoration treatments would be similar to those described in Alternative I. The long-term effects of livestock exclusion would be similar to those described for the No Action Alternative, but would occur over the largest and most contiguous areas of all the alternatives.

The effects of allocations in Alternative V would be similar to Alternative IV. There would be no TNR permits, targeted grazing, or use of big game winter range in Alternative V, and forage on acquired lands and in allotments where permits are relinquished or cancelled would be held over the life of the plan for wildlife habitat and watershed protection. Therefore, Alternative V would provide the greatest level of landscape stability due to retention of plant biomass and structure (Pellant et al., 2005). Alternative V would also provide for the greatest potential for diversification of species composition and community structure; however, the extent of natural diversification would be dependent on the presence of native plants and growing conditions such as precipitation and competition with exotic annuals (Anderson and Inouye, 2001). The lack of reserve common allotments under Alternative V would reduce flexibility for post-wildland fire rest of burned areas, post-treatment rest of ES&BAR, and post-treatment rest of vegetation treatments. Lack of allocation of annual grass to livestock would reduce potential for over-use of perennial grasses in years of low annual grass production. The effects of estimated utilization levels and habitat management for sage-grouse, ground-nesting birds, big game, and other wildlife would be similar to Alternative IV, except stocking rates allowed under resource allocations of 10% to 20% in the Sagebrush Sea ACEC would be lower than what is allowed under Alternative IV across the same area. This would include about 70% of the planning area in VMAs B, C, and D and would promote the long-term success of treatments to convert annual communities and native grassland to native shrubland by minimizing post-treatment effects associated with livestock trampling and grazing (Stevens, 2004).

The effects of installation, construction, maintenance, and removal of grazing facilities would be similar to those described for Alternative I. The number and density of all types of range infrastructure developments would decrease substantially under Alternative V compared to the No Action Alternative to accommodate decreased allocations, especially in the Sagebrush Sea ACEC. Since no new pipelines would be authorized, Alternative V would reduce the potential for linear disturbance and introduction of noxious weeds and invasive plants throughout the planning area. The locations of existing facilities would be modified to meet resource objectives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 1,406,000 acres (96%) of the planning area would be available for livestock grazing and 57,000 acres (4%) would be unavailable. Livestock exclusion would include Canyons associated with the Bruneau and Jarbidge Rivers and Salmon Falls Creek (below the dam), reference areas, Salmon Falls Creek ACEC, wildlife tracts, and areas not contained in grazing allotments. The effects of livestock exclusion on restoration treatments would be similar to those described in Alternative I. The long-term effects of livestock exclusion would be similar to those described for the No Action Alternative, but would occur over a larger area.

Allocation of the majority of vegetation production, more than 66% for native and non-native perennial grass and all annual, shrub, and forb production, to watershed and wildlife would promote landscape stability due to retention of plant biomass and structure (Pellant et al., 2005). Diversification of species composition and community structure would occur in native plant communities; however, the extent of natural diversification would be dependent on the presence of native plants and growing conditions such as precipitation and competition with exotic annuals (Anderson and Inouye, 2001). Low allocation of native perennial grass and shrubs for livestock would support restoration goals to convert annual communities to native shrubland, particularly in VMAs A and B. Because restoration treatments can be slow to establish in low precipitation zones, the potential for success of restoration treatments in these areas and long-term maintenance of restored native shrubland would be increased through minimizing the effects associated with livestock trampling and grazing (Stevens, 2004). Allocation of annual grass to livestock would increase potential for over-use of perennial grasses in years of low annual grass production.

Estimated stocking rates allowed under resource allocations of up to 40% for native communities and up to 45% for non-native communities are generally considered to be of moderate intensity (Holechek, 1988; Holechek et al., 1998). Expected utilization within these ranges, particularly at the lower end of the ranges or below would tend to maintain current levels to slightly reduced soil erosion and soil bulk density and help maintain or increase vegetation cover (Holechek et al., 1999). Under moderate utilization levels in Alternative VI, biological soil crust cover and species diversity would be reduced (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001), which would increase the potential for the introduction and spread of noxious weeds and invasive plants.

The effects of habitat management actions and implementation of BMPs would be similar to Alternative I, except greater residual heights (i.e., seven inches) for late-successional grasses would be more favorable to retention of those species and greater structural diversity.

The effects of TNR permits would be similar to Alternative I, but TNR permits would not be allowed in the Bruneau-Jarbidge Rivers Wilderness and the riparian pasture of the Lower Saylor Creek Allotment in the Sand Point ACEC. The proportion of landscape affected would be less than in the No Action Alternative or Alternatives I, II, or III.

The effects of reserve common allotments would be similar to those described for Alternative II. The effects of TNR permits, targeted grazing, and the installation, construction, maintenance, and removal of grazing facilities would be similar to those described for Alternative I. These effects would occur at a lower density within areas available to grazing compared to the No Action Alternative and Alternatives II and III. Locations of existing facilities would be modified to meet resource objectives. Effects of fence removal or relocation would be similar to those described for Alternative I. The number and density of all types of range infrastructure developments would increase under Alternative VI compared to the No Action Alternative due to increased allocations, which would result in an increase in the potential for the introduction and spread of noxious weeds and invasive plants. However, this increase would be limited by management actions for sage-grouse and slickspot peppergrass.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions on upland vegetation:

- Composition of each Vegetation Management Area (VMA) and the planning area by vegetation sub-group (VSG),
- Composition of each VMA and the planning area by successional stage, and
- Potential for introduction and spread of noxious weeds and invasive plants.

Routes and route density can influence human-related disturbance including introduction and spread of noxious weeds and invasive plants (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003) and human-caused fire (Svejcar, 2003). Changes in travel designation (i.e., open to cross-country motorized vehicle use, limited to designated routes or ways, closed to motorized vehicle use) and seasonal restrictions can influence vegetation continuity and condition.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 25% of the planning area would be open to cross-country motorized vehicle use, 70% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The majority of the closed area is Owyhee County (from the Omnibus Public Land Management Act of 2009), wilderness and where canyonland topography restricts travel. Motorized vehicle use would increase and additional unplanned routes would be created by repeated use in areas open to cross-country motorized vehicle use. This would result in a long-term increase in route density within the planning area.

The primary effect of cross-country motorized vehicle use and roads on upland vegetation communities is an increase in introduction and spread of noxious weeds and invasive plants (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003). Vehicle use results in both shear and compressional forces on the soil surface, destroying biological soil crusts and creating openings for invasion by weedy plants by physically and chemically altering the soil environment (Belnap and Eldridge, 2001; Masters and Sheley, 2001; Stohlgren et al., 2001). Noxious weed and invasive plant introductions would result in modification of native plant community species composition (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003). Wildland fire resulting from human use or natural ignition in areas with increased weed densities would result in decreased proportions of native shrubland and increased proportions of annual, non-native perennial or native grasslands, depending on pre-fire vegetation composition and post-fire treatments.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction that would reduce impacts to upland vegetation due to route or use designations. No actions common to all action alternatives would result in changes in either VSG or successional stages within native plant communities.

Impacts from Management Specific to Alternative I

Under Alternative I, less than 1% of the planning area would be open to cross-country motorized vehicle use, 91% would be limited to designated routes, and 8% would be closed to motorized vehicle use. Approximately 3,600 acres of the Deadman/Yahoo Special Recreation Management Area (SRMA), contained within the Deadman/Yahoo Travel Management Area (TMA), would be designated open to cross-country motorized vehicle use. This relatively small area has a high density of motorized use, which would be expected to continue. This would result in areas that are unvegetated due to concentrated disturbance and high potential for invasion and spread of noxious weeds and invasive plants. Vegetation actions proposed under Alternative I would treat about half of annual communities, approximately 10,000 acres, in the Deadman/Yahoo SRMA using fire-tolerant native and non-native species. When combined with existing vegetation, this would result in about half the SRMA being occupied by native grassland and non-native perennial communities, which would provide a greater level of vegetation and resilience should wildland fires occur. While the potential for invasion and spread of noxious weeds and invasive plants would continue to be high both in open areas and along designated routes, use would not likely result in changes in either VSG, even in the event of wildland fire resulting from human use. Likewise,

areas occupied by annual communities under Alternative I would not be changed. Native shrubland communities would be at risk for weed invasion and spread or wildland fire.

Route density is expected to decrease on about 48% of the planning area. This decrease would be focused in the Canyonlands, Jarbidge Foothills, and Snake River TMAs. The focus on increases in core habitat for mule deer in the Canyonlands and Jarbidge Foothills TMAs would tend to reduce routes in native plant communities, reducing the risk of noxious weed invasion and spread. Route reduction would facilitate vegetation treatments by reducing potential for post-treatment human disturbance, as well as noxious weed invasion and spread. About 49% of the planning area would retain the current level of route density, primarily in the Devil Creek TMA. Since the focus of this TMA would be to balance livestock grazing management needs with restoration activities, route locations would continue to access existing livestock facilities and would be modified to access new facilities. Changes in route density would not likely modify the relative proportions of VSGs.

Actions that allow game retrieval within 300 feet of a designated route and access to camp sites within 25 feet of a designated route would result in an expansion of potential risks to upland vegetation communities beyond the designated route corridor. These actions would result in low density disturbances adjacent to designated routes and would cause localized degradation of plant communities, especially if repeated use occurred. Disturbance due to cross-country motorized vehicle use would have the greatest effect on native shrublands due to crushing of shrubs and biological soil crusts. Exemptions to motorized vehicle restrictions that allow cross-country travel would have effects similar to those described for the No Action Alternative.

Areas closed to motorized vehicle use under Alternative I would include approximately 2% of the total native grassland for the planning area, prior to any vegetation treatments, and 8% of the native shrubland. These areas would be free of impacts associated with cross-country motorized vehicle use and roads described for the No Action Alternative, and would serve as refugia for native plants throughout the planning area (Gelbard and Harrison, 2003). These areas are small and isolated; therefore, there would be limited potential for native plant dispersal beyond the immediate area.

Seasonal closures or restrictions on primitive roads, trails, and open areas would reduce potential for human-caused fire. This would reduce potential for loss of shrubland communities and conversion to annual, non-native perennial, or native grasslands, depending on pre-fire vegetation composition and post-fire treatments.

Implementation of best management practices (BMPs) to control noxious weeds and invasive plants in roadside areas would reduce impacts to upland vegetation in areas that would be open to cross-country motorized vehicle use and limited to designated routes.

Impacts from Management Specific to Alternative II

Under Alternative II, none of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The lack of areas open to cross-country motorized vehicle use would eliminate the impacts described for Alternative I.

Route density would be expected to increase in about 85% of the planning area, with an associated increase in potential for the introduction and spread of noxious weeds and invasive plants, primarily within the Bruneau Desert TMA to facilitate access for commercial uses. Impacts of increased route density within the Bruneau Desert TMA would be similar to impacts described for the No Action Alternative. Route density would be expected to remain the same in about 15% of the planning area, primarily within the Canyonlands TMA to facilitate livestock grazing with mitigation for impacts to resources. Impacts within the Canyonlands TMA would be similar to those described for the Devil Creek TMA in Alternative I.

Unlimited motorized access off designated routes for game retrieval and within 100 feet of a designated route for camp site access in areas not closed to motorized use would result in impacts similar to those described in Alternative I, but would apply to most of the planning area. Exemptions to motorized vehicle

restrictions that allow cross-country motorized vehicle use would have effects similar to those described for the No Action Alternative.

Areas closed to motorized vehicle use under Alternative II would be limited to the wilderness and where canyonland topography restricts travel. This closed area contains 5% native grassland and native shrubland combined. Therefore, areas closed to motorized vehicle use would provide negligible protection to native upland vegetation under Alternative II.

The effects of implementation of BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative III

Under Alternative III, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I. Although the SRMA and TMA are not designated for vegetation treatment under Alternative III, actions prescribed for VMAs A and B focus on conversion of annual communities to non-native perennial communities to reduce fine fuel loads. Since the focus of the area is for cross-country motorized vehicle use and some limitations to designated trails, this area would likely be treated to decrease fire spread and increase resilience in the case of human-caused fire.

Route density would be expected to increase in about 2% of the planning area, primarily within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. The impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to remain the same in about 98% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. These TMAs would be managed to improve access and facilitate wildland fire prevention and suppression. Management might not increase route density, but would improve surface condition. Improvement of road condition would result in wider disturbance areas adjacent to roads due to increased maintenance, including mowing of roadside areas, and increased cover of noxious weeds and invasive plants due to increased use (Gelbard and Belnap, 2003).

Lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites within 25 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions to motorized vehicle restrictions that allow cross-country motorized vehicle use would have effects similar to those described for the No Action Alternative.

Areas closed to motorized vehicle use under Alternative III would be limited to the Salmon Falls Creek Area of Critical Environmental Concern (ACEC) and the Bruneau and Jarbidge Rivers Wilderness, which are physically restrictive to motorized transportation. This closed area contains 5% native grassland and native shrubland combined. Therefore, areas with closed designation would provide negligible protection to native upland vegetation under Alternative III.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative IV

Under Alternative IV, less than 1% of the planning area would be open to cross-country motorized vehicle use, 93% would be limited to designated routes, and 7% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I. Although the SRMA and TMA are not designated for vegetation treatment under Alternative IV, actions prescribed for VMAs A and B focus on conversion of annual communities to native and non-native perennial communities, with emphasis on areas adjacent to the Snake River and its tributaries. Since the focus of the area is for cross-country motorized vehicle use and some limitations to designated trails, it is likely that this area would be treated to decrease fire spread and increase resilience in the case of human-caused fire.

Route density would be expected to increase in about 2% of the planning area, primarily within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in about 98% of the planning area, primarily within the Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs. These TMAs would be managed for protection of sage-grouse and big game habitat and restoration activities while continuing to provide public access. Route reduction would tend to facilitate success of vegetation treatments by reducing potential for post-treatment human disturbance, as well as reducing the potential of the introduction and spread of noxious weeds and invasive plants.

Lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 25 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions to motorized vehicle restrictions that allow cross-country motorized vehicle use would have effects similar to those described for the No Action Alternative.

Areas closed to motorized vehicle use under Alternative IV would include the Bruneau and Jarbidge Rivers Wilderness and Lands with Wilderness Characteristics. The closed areas contain 3% of the native grassland and about 16% of the native shrubland in the planning area. The effects would be similar to those described for Alternative I.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, less than 1% of the planning area would be open to cross-country motorized vehicle use, 88% would be limited to designated routes, and 12% would be closed to motorized vehicle use. The effects of designated open areas in the Yahoo SRMA, which coincides with the Yahoo TMA, would be similar to those described for Alternative I but would be spatially reduced by about 80%. The SRMA and TMA are not identified for vegetation treatment; however, the area is dominated by native and non-native perennial plant communities and would be relatively resilient in the case of human-caused fire.

Route density would be expected to increase in less than 1% of the planning area, primarily within the Yahoo TMA to facilitate motorized recreational opportunities. The impacts of increased route density within the Yahoo TMA would be similar to impacts described for Alternative I, but would apply to less than 1% of the spatial area of Alternative I. Route density would be expected to decrease in about 99% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. These TMAs would be managed for increasing core habitat size for sage-grouse and other special status species and accommodating restoration activities. Route reduction in Alternative V would do the most of all the alternatives to facilitate success of vegetation treatments by reducing potential for post-treatment human disturbance, as well as reducing the potential of the introduction and spread of noxious weeds and invasive plants.

Since the density of routes within the planning area would be reduced, lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites within 25 feet of a designated route would reduce off-road disturbance to the greatest degree of all the alternatives. Application of motorized vehicle restrictions to everyone including lessees, BLM permit holders, and right-of-way holders would reduce the potential for cross-country motorized vehicle use to the greatest degree of all the alternatives and would eliminate most impacts described in the No Action Alternative.

Areas closed to motorized vehicle use under Alternative V would include the wilderness and Wilderness Study Area (WSA), including inventoried ways, and Lands with Wilderness Characteristics. The closed areas contain 9% of the native grassland and about 28% of the native shrubland in the planning area. The effects would be similar to those described for Alternative I, but would cover a larger geographic area.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman SRMA would be similar to those described for the Deadman Recreation Management Zone for Alternative I. The effects of seasonal closures for wildland fire prevention would be similar to those described for Alternative I.

Areas closed to motorized vehicle use in Alternative VI would be the Salmon Falls Creek ACEC, WSA, Bruneau-Jarbidge Rivers Wilderness, which are physically restrictive to motorized transportation.

Route density would be expected to increase in about 3% of the planning area, including within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in about 10% of the planning area, primarily within the Jarbidge Foothills. Route density would remain unchanged within 87% of the planning area, primarily in the Canyonlands, Devil Creek, and Snake River TMAs. The effects of route reduction would be similar to those described for Alternative I but would occur over about five times fewer acres. Route reduction and maintenance would tend to facilitate success of vegetation treatments by reducing potential for post-treatment human disturbance, as well as weed invasion and spread.

Lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites within 100 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative. Exemptions to motorized vehicle restrictions that allow cross-country motorized vehicle use would have effects similar to those described for the No Action Alternative.

The closed areas contain 3% of the native grassland and about 7% of the native shrubland in the planning area. The effects would be similar to those described for Alternative I.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on upland vegetation:

- Composition of each Vegetation Management Area (VMA) and the planning area by vegetation sub-group,
- Composition of each VMA and the planning area by successional stage, and
- Potential for introduction and spread of noxious weeds and invasive plants.

ACECs, regardless of identified important and relevant values, provide some level of protection for upland vegetation. Where ACEC designation requires special management for upland vegetation communities or wildlife habitat, actions can reduce human disturbance, and elevate priority for vegetation protection or restoration. Where vegetation or wildlife habitat is an important and relevant value, impacts of the ACEC designation are analyzed.

Impacts from Management Specific to the No Action Alternative

Actions prescribed under the No Action Alternative for the Bruneau-Jarbidge ACEC would provide general protection for upland vegetation in the Bruneau and Jarbidge Canyons and along the rims. Actions would tend to maintain native plant communities at the current acreage and condition. Placement of livestock facilities (e.g., fencing, water, salt) to draw livestock away from bighorn sheep habitat would shift patterns of livestock use into adjacent communities (i.e., annual, non-native perennial, non-native understory) or outside the ACEC.

Actions prescribed under the No Action Alternative for the Salmon Falls Creek ACEC would generally protect native grassland and shrubland communities.

Impacts from Management Specific to Alternative I

Actions for the Bruneau-Jarbidge ACEC would provide general protection for upland vegetation in the Bruneau and Jarbidge Canyons and along the rims. Actions would tend to maintain native plant communities. Required use of weed-free forage and straw, designating camp areas outside the ACEC, limiting motorized use to designated routes, and integrating treatment of noxious weeds and invasive plants would reduce risk of fragmentation of plant communities or conversion of native communities to annual. The prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of shrubland communities. Placement of livestock facilities (e.g., fencing, water, salt) to draw livestock away from bighorn sheep habitat would protect native communities within the ACEC from concentrated use and would shift patterns of livestock use outside the ACEC.

Actions prescribed under Alternative I for the Lower Bruneau Canyon ACEC would promote restoration of annual and non-native plant communities to native shrubland. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities.

Actions prescribed under Alternative I for the Middle Snake ACEC would promote restoration of annual and non-native plant communities to native shrubland. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities. Livestock trailing through the ACEC would result in short-term, localized disturbance within the trailing corridor for each trailing event. This disturbance would include trampling of plants and removal of vegetation. The amount of impact would depend on the number, frequency, and season of trailing events as well as the number and class of livestock.

Actions prescribed under Alternative I for the Salmon Falls Creek ACEC would generally protect native grassland and shrubland communities. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities.

Impacts from Management Specific to Alternative II

Under Alternative II, the existing ACEC designations would be removed and no new ACECs would be designated, therefore no special management is prescribed. Management related to ACECs would not provide any general protection to upland vegetation.

Impacts from Management Specific to Alternative III

The effects of actions prescribed under Alternative III for the Bruneau-Jarbidge ACEC would be similar to those described for Alternative I, but would apply to about 67% of the area of Alternative I.

The effects of actions prescribed under Alternative III for the Salmon Falls Creek ACEC would be identical to those described for Alternative I.

Impacts from Management Specific to Alternative IV

The Bruneau-Jarbidge ACEC under Alternative IV is a 144% larger than in Alternative I, including more upland vegetation areas. Actions would tend to maintain native plant communities, improve condition, and promote success of vegetation treatments by limiting human and livestock disturbance. Required use of weed-free forage and straw, designating camp areas outside the ACEC, limiting motorized use to designated routes, and integrating treatment of noxious weeds and invasive plants would reduce risk of fragmentation of plant communities or conversion of native communities to annual. The prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of shrubland communities. Placement of livestock facilities (e.g., fencing, water, salt) to draw livestock away from bighorn sheep habitat would protect native communities within the ACEC from concentrated use, and would shift patterns of livestock use outside the ACEC. Adjustment of livestock season of use or stocking rates in pastures to protect Davis peppergrass from December through June would also protect native plant communities by reducing impacts during much of the active growth period for plants.

Actions prescribed under Alternative IV for the Inside Desert ACEC would generally protect native grassland and shrubland communities and restored areas through protections for slickspot peppergrass. Alternative IV-B would protect 56% of the area of Alternative IV-A. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities. The elimination of staging areas for wildland fire suppression and rehabilitation and camping from the ACEC would reduce the potential for human disturbance that would result in small-scale fragmentation of plant communities. The effects of livestock grazing exclusion and motorized vehicle closure on upland vegetation communities are described under *Impacts from Livestock Grazing Actions* and *Impacts from Transportation and Travel Actions*.

Actions prescribed under Alternative IV for the Jarbidge Foothills ACEC would generally protect native grassland and shrubland communities and restored areas by limiting human and livestock disturbance. Alternative IV-B would protect 48% of the area of Alternative IV-A. Required use of weed-free forage and straw, designating camp areas within the ACEC, limiting motorized use to designated routes, and integrated treatment of noxious weeds and invasive plants would all reduce the risk of fragmentation of plant communities or conversion of native communities to annual. The prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of shrubland communities. Management actions that specifically reduce disturbance of sage-grouse during breeding and nesting periods and for protection of habitat would likewise protect native shrubland habitats during active growth periods for plants.

Actions prescribed under Alternative IV for the Lower Bruneau Canyon ACEC would be identical to those described for Alternative I.

Impacts from Management Specific to Alternative V

Actions prescribed under Alternative V for the Lower Bruneau Canyon ACEC would promote restoration of annual communities to native shrubland and non-native perennial communities to non-native understory. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities. The effects of livestock grazing exclusion on upland vegetation communities are described under *Impacts from Livestock Grazing Actions*.

Actions prescribed under Alternative V for the Middle Snake ACEC would promote restoration of annual communities to native shrubland and non-native perennial communities to non-native understory. The effects of actions prescribed under Alternative V would be similar to those described for Alternative I, except that livestock grazing would be allowed in the Asquena pasture. This pasture is primarily annual and non-native perennial vegetation.

Actions prescribed under Alternative V for the Sagebrush Sea ACEC would provide protection for existing and restored native plant communities over about 70% of the planning area including lands in VMAs B, C, and D. Reduction of allocation levels to 10% to 20% and reduction of livestock infrastructure would promote success of restoration treatments by minimizing post-treatment effects associated with livestock trampling and grazing (Stevens, 2004). Required use of weed-free forage and straw, designating camp areas within the ACEC, limiting motorized use to designated routes, and integrating treatment of noxious weeds and invasive plants would all reduce risk of fragmentation of plant communities or conversion of native communities to annual. The prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of existing and restored shrubland communities. However, in the event of multiple starts, the size of the Sagebrush Sea ACEC would reduce the potential for critical resource needs to be identified and acted on.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Actions prescribed under Alternative VI for the Upper Bruneau Canyon ACEC would provide general protection for upland vegetation in the Bruneau Canyon and along the rims. Actions would tend to maintain native plant communities. Designating camp areas outside the ACEC, limiting motorized use to designated routes, and integrating treatment of noxious weeds and invasive plants would reduce risk of

fragmentation of plant communities or conversion of native communities to annual. The prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of shrubland communities. Placement of livestock facilities (e.g., fencing, water, salt) to draw livestock away from bighorn sheep habitat would protect native communities within the ACEC from concentrated use and would shift patterns of livestock use outside the ACEC.

Actions prescribed under Alternative VI for the Lower Bruneau Canyon ACEC would promote restoration of annual and non-native plant communities to native shrubland. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities. The disallowance of surface disturbing activities would further protect vegetation communities within the ACEC.

Actions prescribed under Alternative VI for the Salmon Falls Creek ACEC would generally protect native grassland and shrubland communities. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing shrubland communities.

Actions prescribed under Alternative VI for the Sand Point ACEC would provide limited protection to upland vegetation by limiting ground-disturbing activities.

Summary of Direct and Indirect Impacts

Ratings on each alternative are intended to convey how well each alternative maintains or improves upland vegetation communities based on the indicators. Ratings are for comparison purposes only and are not meant to be additive by alternative or to provide a measure of significance between alternatives.

Impacts from the No Action Alternative

The No Action Alternative would increase the relative proportion of acreage occupied by non-native perennial communities within the planning area while maintaining proportions of annual, native grassland, and native shrubland communities and reducing proportions of non-native understory communities. Vegetation treatments would result in 24% of the planning area being occupied by shrubland communities, including non-native understory (3%) and native shrubland (21%). The lack of prioritization for wildland fire suppression would contribute to long-term maintenance in annual, non-native perennial, and early-successional native communities by perpetuating the current trend of native shrubland loss. Livestock management actions would promote uniform use of perennial grass and dominance by non-native perennial and short-stature, early- and mid-successional grasses. Increased disturbance associated with livestock facilities would likely increase introduction and spread of noxious weeds and invasive plants. Designation of 25% of the planning area as open to cross-country motorized vehicle use would result in continued creation of unplanned routes, fragmentation of plant communities, and introduction and spread of noxious weeds and invasive plants. Maintenance of existing ACECs would have little effect on upland vegetation.

Overall, the No Action Alternative would result in moderate adverse impacts to upland vegetation in the long term.

Impacts from Alternative I

Alternative I would increase the relative proportion of acreage occupied by native shrublands, primarily in VMAs B, C, and D, while decreasing proportions of annual, non-native perennial, non-native understory, and native grassland communities. Vegetation treatments would result in 52% of the planning area being occupied by shrubland communities, including non-native understory (4%) and native shrubland (48%). Over the long term, Alternative I would create a landscape dominated by native communities in a variety of successional stages with greater species diversity and structural complexity compared to the No Action Alternative and Alternatives II and III. Livestock management actions including allocations, estimated utilization levels, residual height for wildlife habitat, and temporary non-renewable (TNR) permits would result in moderate, uniform use that would tend to reduce structural complexity for perennial herbaceous plants.

Wildland fire management priorities would promote protection of existing and restored native shrubland communities and facilitate post-fire conversion of annual, non-native perennial, and native grassland communities to native shrubland. Protection of key sage-grouse habitat would prioritize suppression resources for native shrubland; however, critical suppression priorities would not be adequate to retain all native vegetation. There would likely be continued loss of native shrublands.

Actions associated with cross-country motorized vehicle use, use and maintenance of designated routes, fuel breaks, livestock facilities, targeted grazing, and periodic heavy use to promote establishment of shrubs all cause soil surface disruption and vegetation removal that would tend to promote invasion and spread of noxious weeds and invasive plants. While cross-country motorized vehicle use and route density would decrease compared to the No Action Alternative, disturbance associated with fuel breaks and livestock management would be similar to the No Action Alternative or slightly increased. This would not likely result in large-scale conversion of native or non-native communities to annual communities, but would result in localized degradation of plant communities that would expand over the long term. Actions for treatment of noxious weeds and invasive plants would reduce the risk of introduction due to roads and recreational access, particularly in native plant communities.

Actions associated with ACECs would provide protection to existing and restored native plant communities, primarily in the Bruneau, Jarbidge, and Salmon Falls Creek Canyons, that would result in reduced potential for degradation or loss due to human and livestock uses, noxious weeds, invasive plants, or wildland fire.

Overall, Alternative I would result in a minor beneficial impacts to upland vegetation in the long term.

Impacts from Alternative II

Alternative II would result in a composition of upland vegetation communities within the planning area similar to the No Action Alternative. The relative proportion of non-native perennial communities would increase in all VMAs and would result from conversion of annual communities or removal of shrubs from non-native understory communities. Relative proportions of native grassland and native shrubland would not change due to vegetation treatments. This would create a relatively homogeneous landscape dominated by early-successional and uncharacteristic vegetation in VMAs A, B, and C. Vegetation treatments would result in about 25% of the planning area being occupied by shrubland communities, including non-native understory (3%) and native shrubland (22%), with the majority occurring in VMA D. Limited species and structural diversity in areas dominated by non-native perennial vegetation would decrease water and nutrient cycling compared to shrubland communities. Livestock management actions, including allocations, utilization standards, residual height for wildlife habitat, and TNR permits would promote uniform use of perennial grass and long-term dominance of the planning area, primarily in VMAs A, B, and C, by non-native perennial and short-stature, early- and mid-successional grasses.

Fire management priorities would promote protection of native grassland and non-native perennial communities with no prioritization for shrubland communities. It is likely that there would be continued loss of native shrublands under Alternative II. The absence of critical suppression areas outside of the wildland urban interface would increase the potential for re-burning of upland vegetation communities.

Actions associated with cross-country motorized vehicle use, maintenance and use of designated routes, fuel breaks, livestock facilities, targeted grazing, and periodic heavy grazing all cause soil surface disruption and vegetation removal that would tend to promote invasion and spread of noxious weeds and invasive plants. While cross-country motorized vehicle use would decrease compared to the No Action Alternative, increased allocations for livestock grazing as well as travel associated with commodity and resource use would increase the number, size, and density of disturbed areas. This would not likely result in large-scale conversion of native or non-native communities to annual communities, but would result in localized degradation of plant communities and would increase the potential for expansion over the long term. Actions for treatment of noxious weeds and invasive plants would not reduce risk of introduction due to roads and recreational access, stock driveways or other high use areas. Therefore, there would be a higher potential for introduction and spread of noxious weeds and invasive plants under Alternative II compared to the other alternatives.

There would be no ACECs under Alternative II. No areas supporting upland plant communities would receive additional protections.

Overall, Alternative II would result in moderate adverse impacts to upland vegetation in the long term.

Impacts from Alternative III

Actions prescribed in Alternative III would increase the relative proportion of acreage occupied by native shrublands in VMAs B, C, and D and non-native perennial communities within the entire planning area. Proportions of annual and native grassland communities would decrease and non-native understory would remain unchanged. Vegetation treatments would result in 41% of the planning area being occupied by shrubland communities, including non-native understory (4%) and native shrubland (37%). Over the long term, Alternative III would create a landscape dominated by perennial vegetation with native communities in a variety of successional stages interspersed with non-native perennial communities to disrupt fuel continuity. This would result in a greater number of native patches with more species diversity and structural complexity than would be created under either the No Action Alternative or Alternative II. Native communities, particularly shrublands, would be less continuous than in Alternatives I, IV, V, or VI. Livestock management actions, including allocations, utilization standards, residual height for wildlife habitat, and TNR permits would result in moderate, uniform use that would tend to reduce structural complexity for perennial herbaceous plants.

Wildland fire management priorities would promote protection of native shrubland, as well as native grassland and non-native perennial communities. Native grassland and non-native perennial communities would be relatively resilient if burned, and burning would facilitate establishment of shrubs in native grasslands to disrupt fuel continuity in VMAs B, C, and D through post-fire treatments. Critical suppression priorities would not be adequate to protect all priority vegetation sub-groups (VSGs) and the potential for re-burning would be relatively high, particularly in VMA C. Protection of key sage-grouse habitat would prioritize suppression resources for native shrublands and reduce the potential for loss of existing shrubland patches.

Actions associated with cross-country motorized vehicle use, maintenance and use of designated routes, fuel breaks, livestock facilities, targeted grazing, and periodic heavy use to promote establishment of shrubs all cause soil surface disruption and vegetation removal that would tend to promote invasion and spread of noxious weeds and invasive plants. While cross-country motorized vehicle use would decrease, route density would remain similar to the No Action Alternative, disturbance associated with fuel breaks and livestock management would be greater than the No Action Alternative and Alternatives I, IV, and V. This would not likely result in large-scale conversion of native or non-native communities to annual communities, but would result in localized degradation of plant communities that would expand and connect over the long term. Actions for treatment of noxious weeds and invasive plants would treat areas with high-potential for introduction such as fuel breaks, areas with high wildland fire occurrence, and roadsides, reducing the risk of invasion and spread.

Actions associated with ACECs would provide protection to existing and restored native plant communities, primarily in the Bruneau, Jarbidge, and Salmon Falls Creek Canyons, resulting in reduced potential for degradation or loss due to human and livestock uses, noxious weeds, invasive plants, or wildland fire. The area protected by the Bruneau-Jarbidge ACEC would be about 67% of the area protected under Alternative I.

Alternative III would have both adverse and beneficial impacts to upland vegetation, resulting in an overall neutral impact. Alternative III would provide for protection and restoration of native shrublands; however, the mechanisms required for those activities (i.e., use of roads, fire breaks, targeted grazing) would increase potential for the spread of noxious weeds and invasive plants.

Impacts from Alternative IV

Alternative IV would increase the relative proportion of acreage occupied by native shrublands across the planning area while decreasing the proportions of annual, non-native perennial, non-native understory, and native grassland communities. Vegetation treatments would result in 69% of the planning area

occupied by shrubland communities, including non-native understory (10%) and native shrubland (59%). Over the long term, Alternative IV would create a landscape dominated by native communities in a variety of successional stages and the lowest proportion of uncharacteristic vegetation of all the alternatives. The greater proportion and continuity of diverse native shrubland communities, compared to the other alternatives, would improve functions associated with these communities, including water infiltration, nutrient cycling, and soil stabilization. Livestock management actions, including allocations, utilization standards, residual height for wildlife habitat, and TNR permits, coupled with vegetation treatments, would result in greater structural complexity for both woody and herbaceous vegetation throughout the planning area compared to the No Action Alternative and Alternatives I, II, and III.

Wildland fire management priorities would promote the protection of existing and restored native shrubland communities and facilitate post-fire conversion of annual, non-native perennial, and native grassland communities to native shrubland. The protection of key sage-grouse habitat would prioritize suppression resources for native shrublands. Critical suppression priorities would not be adequate to retain all native communities; however, native grasslands would be relatively resilient if burned. As other VSGs are converted to native shrubland, the potential for protection of all native shrubland communities would be reduced; therefore, it is likely that these communities would revert to native grassland in less resilient areas with lower suppression priority such as VMA A.

Actions associated with cross-country motorized vehicle use, maintenance and use of designated routes, fuel breaks, livestock facilities, targeted grazing, and periodic heavy use to promote establishment of shrubs all cause soil surface disruption and vegetation removal that would tend to promote invasion and spread of noxious weeds and invasive plants. Cross-country motorized vehicle use, route density, disturbance associated with fuel breaks and livestock management would be reduced compared to the No Action Alternative and Alternatives I, II, III, and VI. This would reduce the potential for localized degradation of plant communities and expansion of disturbed areas. Actions for treatment of noxious weeds and invasive plants would not reduce the potential for introduction in high use areas. However, due to reduction of activities that would result in introduction and spread, coupled with the greatest level of treatment of all the alternatives, Alternative IV would make the most progress towards control or eradication.

Actions associated with ACECs would provide greater protection to existing and restored native plant communities, especially native shrublands, than the No Action Alternative and Alternatives I, II, III, and VI. This would substantially reduce the potential for degradation or loss of native shrublands due to human or livestock uses, noxious weeds, invasive plants, or wildland fire in 17% (Alternative IV-B) or 24% (Alternative IV-A) of the planning area, primarily in VMAs B, C, and D.

Overall, Alternative IV would result in moderate beneficial impacts to upland vegetation in the long term.

Impacts from Alternative V

Alternative V would increase the relative proportion of acreage occupied by non-native understory and native shrublands across the planning area while decreasing proportions of annual, non-native perennial, and native grassland communities. Vegetation treatments would result in 59% of the planning area occupied by shrubland communities, including non-native understory (19%) and native shrubland (40%). Over the long term, Alternative V would create a landscape dominated by perennial vegetation with large patches of native communities in a variety of successional stages interspersed with non-native perennial and non-native understory communities. The greater proportion and continuity of diverse native shrubland communities, compared to the No Action Alternative and Alternatives I, II, and III, would improve functions associated with these communities, including water infiltration, nutrient cycling, and soil stabilization. Livestock management actions, including allocations, utilization standards, residual height for wildlife habitat, and lack of TNR permits, coupled with vegetation treatments, would result in the greatest potential for species diversity and structural complexity and the highest potential for landscape stability compared to the No Action Alternative and all other action alternatives.

Wildland fire management priorities would promote protection of existing and restored native shrubland communities and facilitate post-fire conversion of annual and non-native perennial communities to native.

The protection of key sage-grouse habitat would prioritize suppression resources for native shrublands. Most of this conversion would likely occur in VMA A. In VMAs B, C, and D, opportunities would be limited for post wildland fire treatments; therefore, Alternative V would require more use of prescribed fire in these VMAs as part of vegetation treatments.

Actions associated with cross-country motorized vehicle use, maintenance and use of designated routes, fuel breaks, and livestock facilities all cause soil surface disruption and vegetation removal that would tend to promote invasion and spread of noxious weeds and invasive plants. Cross-country motorized vehicle use, route density, disturbance associated with fuel breaks and livestock management would be the least of all alternatives. This would reduce the potential for localized degradation of plant communities and expansion of disturbed areas. Actions for treatment of noxious weeds and invasive plants would not reduce potential for introduction in high use areas. However, due to reduction of activities that would result in introduction and spread, coupled with the intermediate levels of treatment compared to the other alternatives, Alternative V would make intermediate progress towards control or eradication.

Actions associated with ACECs would provide a greater level of protection to existing and restored native plant communities, especially native shrublands, than any of the other alternatives. This would substantially reduce the potential for degradation or loss of native shrublands due to noxious weeds, invasive plants, or wildland fire over greater than 70% of the planning area, primarily in VMAs B, C, and D.

Overall, Alternative V would result in minor beneficial impacts to upland vegetation in the long term.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would increase the relative proportion of acreage occupied by native shrublands while decreasing the proportions of annual, non-native perennial, non-native understory, and native grassland communities. Vegetation treatments would result in 60% of the planning area occupied by shrubland communities, including non-native understory (7%) and native shrubland (53%). Over the long term, Alternative VI would create a landscape dominated by native communities in a variety of successional stages and a lower proportion of uncharacteristic vegetation than the No Action Alternative and Alternatives II, III, and V. The greater proportion and continuity of diverse native shrubland communities, compared to these alternatives, would improve functions, including water infiltration, nutrient cycling, and soil stabilization. Livestock management actions, including allocations, utilization standards, residual height for wildlife habitat, and TNR permits, coupled with vegetation treatments, would result in greater structural complexity for both woody and herbaceous vegetation compared to the No Action Alternative and Alternatives I, II, and III.

Wildland fire management priorities would promote the protection of existing and restored native shrubland communities and facilitate post-fire conversion of annual, non-native perennial, and native grassland communities to native shrubland. The protection of the sage-grouse management area would prioritize suppression resources for native shrublands. Critical suppression priorities would not be adequate to retain all native communities; however, native grasslands would be relatively resilient if burned. As other VSGs are converted to native shrubland, the potential for protection of all native shrubland communities would be reduced; therefore, it is likely that these communities would revert to native grassland in less resilient areas with lower suppression priority.

Actions associated with cross-country motorized vehicle use, maintenance and use of designated routes, fuel breaks, livestock facilities, targeted grazing, and periodic heavy use to promote establishment of shrubs all cause soil surface disruption and vegetation removal that would tend to promote invasion and spread of noxious weeds and invasive plants. Cross-country motorized vehicle use, route density, disturbance associated with fuel breaks and livestock management would be reduced compared to the No Action Alternative and Alternatives I, II, and III. This would reduce the potential for localized degradation of plant communities and expansion of disturbed areas. Actions for treatment of noxious weeds and invasive plants would not reduce potential for introduction in high use areas.

Actions associated with ACECs would provide more protection to existing and restored native plant communities, especially native shrublands, than Alternative II. This would reduce the potential for

degradation or loss of native shrublands due to human or livestock uses, noxious weeds, invasive plants, or wildland fire in 2% of the planning area.

Overall, Alternative VI would result in moderate beneficial impacts to upland vegetation in the long term.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Cumulative impacts for upland vegetation communities consist of incremental effects of the alternatives when added to other past, present, and reasonably foreseeable future actions. These effects can occur over a long period of time, resulting in changes in upland vegetation communities.

Because of similarities in geology, soils, and vegetation, the planning area and the following areas form the geographic boundary for the analysis of cumulative impacts on upland vegetation: adjacent portions of the Burley, Bruneau, Shoshone, and Wells (NV) Field Offices and Snake River Birds of Prey National Conservation Area; the South Hills Unit of the Sawtooth National Forest; and the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest. The area includes Federal, State, and private lands. The temporal scope of the analysis is approximately 20 years or the life of the plan.

Past, present, and reasonably foreseeable actions for the following resources and resource uses cumulatively affect upland vegetation communities:

- Military Use,
- Upland Vegetation,
- Noxious Weeds and Invasive Plants,
- Wildland Fire Ecology and Management,
- Livestock Grazing, and
- Transportation and Travel.

These actions are described in the *Introduction* to this chapter.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Past livestock grazing, wildland fires, and vegetation treatments have resulted in vegetation removal and, in some areas, replacement of native plant communities with annual or non-native perennial communities. This conversion has been extensive throughout the cumulative analysis area, particularly in areas where the elevation is less than 5,000 feet. Wildland fires and associated impacts to plant communities are expected to continue throughout the analysis area. High suppression priorities for ignitions on military ranges would shift suppression efforts away from BLM-managed lands within the planning area or adjacent Federal, State, or private lands in the event of multiple incidents. This would result in local or large-scale changes in vegetation sub-groups (VSGs) or successional stages of native plant communities due to burning of adjacent Federal, State, or private land and possibly post-fire vegetation treatments. Lack of priority on suppressing wildland fires would result in increased changes in VSGs as wildland fires spread from adjacent Federal, State, and private lands onto the planning area. Vegetation treatments that reduce acreage of annual communities and increase acreage of non-native and native perennial communities are expected to continue, primarily on adjacent Federal lands. This would reduce potential for future conversion of these areas to annual communities in the event of wildland fire.

Removal of livestock from burned public lands and shifting use elsewhere would result in increased use on other Federal, State, or private lands. This would increase potential for localized introduction and spread of noxious weeds and invasive plants in these areas.

Twenty-five percent of the planning area would remain open to cross-country motorized vehicle use, users from surrounding areas with more restrictions (e.g., National Forests and the Snake River Birds of Prey National Conservation Area) are expected to utilize the planning area, increasing the potential for spread of noxious weeds and invasive plants.

Cumulative Impacts from Alternative I

Under Alternative I, cumulative impacts related to wildland fire would be due to upland vegetation treatments and wildland fire management actions that would increase vegetation resilience and reduce fire size. This would potentially reduce impacts of wildland fire and associated potential VSG conversions on adjacent Federal, State, and private lands. There would be an increased priority on suppressing wildland fires as they spread from adjacent Federal, State, and private lands into these critical suppression areas.

Alternative I would increase the number of acres closed to motorized vehicle use and limited to designated routes within the cumulative analysis area. Restrictions in the planning area may result in increased impacts on adjacent Federal and State lands where cross-country motorized vehicle use is less restricted. Increased impacts to adjacent BLM lands would occur until the Bruneau, Burley, and Shoshone Field Offices prepare resource management plans for their respective planning areas. Likewise, the Humboldt-Toiyabe National Forest has initiated its travel management planning process. According to current policy, transportation and travel allocations would substantially decrease the amount of areas open to cross-country motorized vehicle use. This would decrease the potential for introduction and spread of noxious weeds and invasive plants, both within and adjacent to the planning area.

Cumulative Impacts from Alternative II

Cumulative impacts regarding potential activities that would result in VSG conversions and introduction and spread of noxious weeds and invasive plants under Alternative II are expected to be similar to the No Action Alternative. Alternative II prioritizes the least acreage of all action alternatives for critical suppression and creates a landscape dominated by non-native perennial communities. While these plant communities are relatively resilient in the event of wildland fire, wildland fire management priorities would increase potential for wildland fire spread to adjacent Federal, State, and private lands. There would be an increased priority on suppressing wildland fires as they spread from adjacent Federal, State, and private lands into these critical suppression areas. This would increase potential in those areas for VSG conversions.

Although no areas would be open to cross-country motorized vehicle use, the effects to vegetation, including introduction and spread of noxious weeds and invasive plants, would be larger in scale due to the expected increase in route density associated with commercial operations. As with Alternative I, the lack of opportunities for cross-country motorized vehicle use would likely shift current use to adjacent Federal or State lands with fewer restrictions.

Cumulative Impacts from Alternative III

Under Alternative III, cumulative effects of wildland fire management on upland vegetation are expected to be slightly greater than for Alternative I. Increases in wildland fire suppression infrastructure would reduce potential for wildland fire to spread to adjacent Federal, State, and private lands. There would be an increased priority on suppressing wildland fires as they spread from adjacent Federal, State, and private lands into these critical suppression areas. However, potential for introduction and spread of noxious weeds and invasive plants would be greater from wildland fire suppression activities. Cumulative impacts related to transportation and travel actions would be similar to Alternative I.

Cumulative Impacts from Alternative IV

Under Alternative IV, cumulative effects of wildland fire management are expected to be slightly less than for Alternative I. This is due to greater acreage prioritized for critical suppression and reduced potential for wildland fire spread to adjacent Federal, State, and private lands. There would be an increased priority on suppressing wildland fires as they spread from adjacent Federal, State, and private lands into these critical suppression areas. Cumulative effects of transportation and travel actions would be similar to Alternative I.

Cumulative Impacts from Alternative V

Under Alternative V, cumulative effects of wildland fire management on upland vegetation are expected to be lowest of all alternatives. Critical suppression priorities would reduce potential for spread to adjacent Federal, State, and private lands. There would be an increased priority on suppressing wildland fires as

they spread from adjacent Federal, State, and private lands into these critical suppression areas. Alternative V contains the most restrictive travel management allocations of all the alternatives. Therefore lack of opportunities for cross-country motorized vehicle use would likely shift current use to adjacent Federal or State lands with fewer restrictions.

Cumulative Impacts from Alternative VI (Proposed RMP)

Under Alternative VI, cumulative effects of wildland fire management on upland vegetation are expected to be slightly greater than for Alternative I. Increases in wildland fire suppression infrastructure would reduce potential for wildland fire to spread to adjacent Federal, State, and private lands. There would be an increased priority on suppressing wildland fires as they spread from adjacent Federal, State, and private lands into these critical suppression areas. Cumulative impacts related to transportation and travel actions would be similar to Alternative I.

4.3.5.2. Riparian Areas and Wetlands

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to conditions of riparian areas and wetlands:

- **Riparian condition of Priority 1 and 2 reaches** – Proper functioning condition (PFC) is a qualitative assessment of the physical function of streams, wetlands, lakes, reservoirs, and other areas associated with riparian or wetland vegetation. PFC ratings are evaluations of riparian conditions based on hydrology, riparian vegetation, and the balance between erosional and depositional forces.

The PFC ratings include: PFC, functioning at risk with an upward trend (FAR-UP), functioning at risk with no apparent trend (FAR-NA), functioning at risk with a downward trend (FAR-DN), and non-functioning (NF). Stream reaches rated as FAR-NA and FAR-DN were prioritized as Priority 1 for restoration, streams rated as FAR-UP and NF were prioritized as Priority 2 for restoration, and streams rated as PFC were prioritized as Priority 3 for restoration. Priority 1 and 2 reaches have an increased risk for impacts to riparian and instream condition due to their reduced condition and have an increased risk of not attaining or moving toward riparian areas and wetlands objectives.

Methods and Assumptions

Impacts to riparian areas and wetlands from management in the following sections of Chapter 2 were analyzed in detail: *Riparian Areas and Wetlands*, *Special Status Species*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations*, *Minerals*, and *Areas of Critical Environmental Concern*. Impacts from management in the *Water Resources*, *Upland Vegetation*, and *Fish and Wildlife* sections were captured in the analysis of sections that were analyzed in detail and, to avoid repetition, were not discussed separately. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for riparian areas and wetlands. Impacts from management for riparian areas and wetlands can be found under *Impacts from Riparian Areas and Wetlands Actions* in the *Water Resources*, *Fish*, *Wildlife*, *Special Status Fish and Aquatic Invertebrates, Special Status Wildlife*, and *Livestock Grazing* sections.

Assessing PFC is the first step in determining riparian and wetland condition. The guidance for assessing PFC for riparian areas can be found in Riparian Area Management: A Users Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (BLM, 1998a). The guidance for assessing PFC for wetland areas can be found in Riparian Area Management: A Users Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas (BLM, 1999a). Both of these references were used to complete the PFC assessments for riparian areas and wetlands that were carried forward into this analysis.

PFC evaluates the physical characteristics of the riparian ecosystem. Where instream channel characteristics and riparian vegetation are functioning properly, the habitat requirements for fish and wildlife are also maintained. While streams at PFC are conducive to good fish habitat, PFC does not address all biological requirements of fish and wildlife including, but not limited to, factors such as barriers to migration and impaired water quality. Therefore, PFC is a starting point, or a minimum condition needed, to sustain fish and wildlife resources. At PFC, the stream channel stabilizes at a point when the vegetation, water, and landform are in a relative balance. After a stream reach has reached PFC, vegetation continues to improve resulting in improvements in instream conditions. Once instream condition improves to a condition which fully supports the needs of special status fish and aquatic invertebrate species water quality also improves. For this reason, the PFC was considered in the analysis for riparian areas.

Riparian Areas

Riparian areas are lands adjacent to or contiguous with permanent or intermittently flowing water bodies (Hansen and Hall, 2002). The boundaries of the riparian area extend outward to the limits of flooding and upward into the canopy of streamside vegetation (Gregory et al., 1991; Swanson et al., 1982). Indicators that include vegetative and instream characteristics are important for evaluating the functionality of riparian systems and their interrelated physical and biotic components. These indicators are included in the PFC rating for evaluating riparian areas and were used to analyze the impacts from management actions.

The PFC ratings were used to prioritize riparian reaches for restoration. The priority for restoration focuses on stream reaches that are FAR-NA or FAR-DN. Non-functioning (NF) stream reaches were included in the assessment, but are generally not considered a priority for restoration because the reduced riparian condition can be a result of factors beyond BLM discretion (i.e., dewatering). The effort, cost, and time required for recovery in NF riparian areas is dramatically increased compared to riparian areas that are closer to PFC (BLM, 1998a). Areas that are at PFC are usually not a high priority for restoration because they are already properly functioning and are more resilient than the FAR areas.

The priorities for riparian restoration by functional condition rating are displayed in Table 4-99. The analysis for riparian areas was based on 225 miles of PFC data. Stream reaches with these PFC ratings are referred to as Priority 1, Priority 2, or Priority 3 reaches through the rest of the document.

Table 4-99. Riparian Proper Functioning Condition Ratings and Priorities for Restoration (Miles)

Riparian PFC Rating	Priority for Restoration	Miles of Stream
FAR-NA and FAR-DN	Priority 1	77
FAR-UP and NF	Priority 2	63
PFC	Priority 3	85
Total		**225**

The effects analysis compared management actions under each alternative to the riparian management goal and objectives. Either the action contributes to attaining the goal and objectives, has a neutral effect, or reduces the likelihood that the goal and objectives would be achieved. Within each of the alternatives, a certain amount of risk for impacts to riparian conditions associated with actions under the various resources; the level of risk influences whether the objectives for riparian management would be met over the life of the plan.

Perennial stream miles were provided to establish a context for the miles of streams with the potential to be affected by a specific land use allocation and to provide a relationship between the amount of riparian area within the allocation area relative to the amount of riparian area with PFC data.

Wetlands

It is estimated that fewer than 10% of the wetlands in the planning area have been assessed for PFC. PFC assessments may be completed as part of rangeland health assessments, grazing allotment reviews, and other project planning efforts to facilitate the development of restoration priorities for

wetlands. The wetlands impact analysis focuses on management actions that have the potential to affect wetland conditions through authorized land uses (i.e., livestock grazing, transportation and travel, recreation, land use authorizations, and minerals).

The assumptions used in the analysis of impacts to riparian areas and wetlands include the following:

- Riparian PFC is a broad-scale rating representative of riparian conditions an entire stream reach. Small components of the reach may display conditions that are more or less than the overall reach rating, but on the whole, the PFC assessments are an accurate representation of the current condition.
- Streams without PFC data would be affected by management actions in a similar manner as streams with condition data.
- Miles of stream type are accurate to the best available knowledge. PFC miles represent actual on-the-ground miles that have been verified.
- Intermittent streams contain riparian characteristics (i.e., hydric vegetation, defined stream channel, contains surface water more than 30 days a year) and were included in the PFC condition summaries. The inclusion of intermittent streams with PFC data yields a more comprehensive analysis of the current riparian condition.
- Riparian areas along larger rivers are more resistant to wildland fire than riparian areas along smaller headwater streams.
- The use of the Multiple Indicator Monitoring protocol (Burton et al., 2011) to determine short- and long-term trends would detect areas where the objectives for Riparian Conservation Area improvement were not being achieved. The use of adaptive management would ensure objectives would be met.
- The analysis assumes that construction and operation would occur at some level related to allowable uses. Construction, operation, and maintenance may result in direct, indirect or cumulative impacts to the resources that occur within the land allocation area.
- Riparian areas and stream channels exhibit natural variability (Kershner et al., 2004) and are inherently unstable due to erosional and depositional forces on the streambanks and streambed (Kershner and Roper, 2010).
- A portion of the streams within the planning area that appear to be non-functional as defined under the PFC protocol (Chapter 3) are limited by their natural hydrology (located above the water table) or are dewatered due to reasons that are beyond the BLM's authority (i.e., Idaho and Nevada water law).
- Active restoration techniques would result in faster rates of recovery and improvement of riparian condition than passive restoration techniques.

Direct and Indirect Impacts

Impacts from Riparian Areas and Wetlands Actions

Riparian vegetation, such as trees, shrubs, grasses, and forbs, all play an important role in building and maintaining productive streams. Trees provide shade and streambank stability because of their large size and massive root systems. As trees mature and fall into or across streams, they create pools and riffles, and their large mass also helps to control the slope and stability of the channel. Shrubs not only protect the streambank from water erosion, its low overhanging height adds cover that is used by fish. Shrubs, like trees, build stability in streambanks through its root systems and leaf litter. Grasses form the vegetative mats and sod banks that reduce surface erosion and mass wasting of streambanks (Platts, 1991). Streamside vegetation needs to be vigorous and dense and to have enough species diversity that it can form layers over the ground. Each vegetative type plays an important role in forming and protecting the aquatic habitat (Platts, 1991). Riparian vegetation reduces instream fine sediments, the intensity of solar radiation, assimilates nutrients, and moderates streamflows. These values are a component of proper functioning condition (PFC) ratings and riparian conditions. When instream and riparian conditions are functioning properly, the goals and objectives for riparian areas and wetlands would be met.

The following indicator was used to analyze the impacts of Riparian Areas and Wetlands actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes direction to maintain or improve riparian habitat condition and identifies fish and riparian values as a high priority. Riparian and wetland habitat would have a high priority for protection and improvement according to national policy. Management actions in floodplains and wetlands include measures to preserve, protect, and, if necessary, restore their natural function. In general, the management direction is to avoid uses in the riparian buffer zone, but there is no direction for improving or restoring riparian condition over the life of the plan. The conditions of the riparian areas in the planning area are expected to be maintained under this management direction.

The No Action Alternative provides general direction for wetlands in conjunction with riparian areas, but does not provide specific management direction for maintaining or improving wetland condition. Wetland conditions within the planning area are expected to be maintained under this management direction.

Impacts from Management Common to All Action Alternatives

All action alternatives include riparian objectives to maintain or improve riparian condition using the priorities for restoration and the PFC ratings displayed in Appendix D (Tables D-4 and D-5). Riparian management for all alternatives would maintain or improve riparian condition which would also maintain or improve instream habitat conditions for special status fish and aquatic invertebrate species and wildlife. The rate of improvement in riparian condition would vary between alternatives according the amount of authorized uses and activities and the passive or active restoration emphasis. The result of riparian management would be an improvement in riparian conditions for Priority 1 and 2 reaches and maintaining the Priority 3 reaches. For all action alternatives, active riparian restoration actions would result in short-term, localized impacts to riparian conditions, but riparian and instream conditions would improve in the long term.

The Aquatic and Riparian Management Strategy (ARMS, Appendix D) provides direction to use adaptive management (Williams et al., 2009) to reduce impacts on riparian areas and wetlands from BLM authorized uses and activities. By adjusting management strategies as supported by monitoring or other site-specific data, adaptive management would result in a long-term trend toward meeting riparian objectives. The use of the Multiple Indicator Monitoring Protocol (Burton et al., 2011) would determine trend and allow adaptive management to be implemented to improve riparian areas and assure conditions are progressing toward achieving riparian objectives.

All action alternatives include objectives for managing wetlands to move toward or achieve PFC. This is expected to reduce impacts to wetlands over the life of the plan. The wetland condition is expected to improve under all action alternatives as a result. The ARMS includes direction to apply the Idaho Stream Channel Alteration rules to actions involving construction in the high water lines and to apply the Grazing Management Processes and Strategies for Riparian-Wetland Areas (Wyman et al., 2006) to riparian areas and wetlands that do not contain special status fish and aquatic invertebrate species. These management documents would reduce impacts to riparian areas and wetlands and improve PFC ratings over the long term.

Impacts from Management Specific to Alternative I

Riparian management would result in 60 miles of Priority 1 reaches achieving PFC, 17 miles of Priority 1 and 63 miles of Priority 2 reaches moving toward PFC, and 85 miles of Priority 3 reaches being maintained at PFC. Under this management, 145 miles of stream would achieve PFC and 80 miles would be moving toward PFC over the life of the plan. Alternative I is expected to have more improvement in riparian condition than the No Action Alternative and Alternative II, but less than Alternatives III, IV, V and VI.

Impacts from Management Specific to Alternative II

Riparian management would result in 77 miles of Priority 1 reaches and 63 miles of Priority 2 reaches moving toward PFC, and 85 miles of Priority 3 reaches being maintained at PFC. Under this management, 85 miles of stream would be at PFC and 140 miles would be moving toward PFC. It is expected that a portion of the reaches moving toward PFC would actually achieve PFC. Alternative II is expected to have fewer miles of stream achieving PFC than the other action alternatives, but there would be more improvement in riparian conditions than would be expected for the No Action Alternative. The rate of improvement in riparian conditions is expected to be slower for Alternative II than for the other alternatives, except for the No Action Alternative.

Impacts from Management Specific to Alternative III

Riparian management would result in 77 miles of Priority 1 reaches and 21 miles of Priority 2 reaches achieving PFC, 42 miles of Priority 2 reaches moving toward PFC, and 85 miles of Priority 3 reaches being maintained at PFC. Under this management, 183 miles of stream would achieve PFC and 42 miles would be moving toward PFC over the life of the plan. The priority areas for active restoration would be in habitats occupied by special status species which are broadly distributed across the planning area. Alternative III would have more miles of PFC rated stream achieving PFC than the No Action Alternative and Alternatives I and II. It would have the same miles of PFC rated stream achieving PFC as Alternatives IV, V, and VI. Improvements in riparian condition would be the same for these three alternatives, which is more than the No Action Alternative and Alternatives I and II.

Impacts from Management Specific to Alternatives IV and VI (Proposed Plan)

The impacts of riparian management on PFC rated streams for Alternatives IV and VI are the same as described for Alternative III. The priority areas for active riparian restoration would be in habitats occupied by special status species. The increased emphasis for active restoration would result in a greater risk of short-term, localized impacts to riparian conditions, but the amount and rate of improvement in riparian conditions is expected to be faster than for the other alternatives.

Impacts from Management Specific to Alternative V

The impacts of riparian management on PFC rated streams are similar to Alternative III. However, the priority areas for active riparian restoration would be in habitats occupied by special status species, with active restoration being limited to functioning at risk with a downward trend or non-functioning reaches. The increased emphasis for passive restoration would result in a fewer short-term impacts to riparian conditions, but slower rates of recovery for PFC ratings as compared to the other alternatives. The passive restoration techniques would result in some riparian reaches having limited improvement where active techniques would be more effective in improving PFC ratings over the long term.

Impacts from Special Status Species Actions

Managing streams to maintain and promote the biological needs of special status fish and aquatic invertebrate species directly influences proper functioning condition (PFC) ratings. Special status fish and aquatic invertebrate species require stable streams that are well vegetated with low instream fine sediments and cool water temperatures for survival and reproduction (Appendix D, Tables D-1 and D-2). Shaded stream areas are preferred habitats of juvenile salmonids (Platts, 1991).

The following indicator was used to analyze the impacts of Special Status Species actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches.

Actions that restore and improve instream conditions for special status species habitat would also result in improved PFC ratings for riparian areas.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes management direction to protect the riparian habitat for Candidate and Sensitive species. Specific direction is provided for the Snake River below lower Salmon Falls Dam which would protect and maintain, to the extent possible, habitats occupied by special status aquatic snails. The

500-foot year-round occupancy restrictions for oil and gas exploration and development would reduce the potential for oil and gas exploration and development to reduce riparian and wetland condition relative to this use. The No Action Alternative would be expected to maintain riparian and wetland condition for streams containing special status fish and aquatic invertebrate species over the life of the plan.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The No Action Alternative and all action alternatives include direction to follow conservation measures in biological opinions and letters of concurrence as appropriate. This direction would maintain or improve riparian condition in streams containing special status fish and aquatic invertebrate species for which Endangered Species Act consultation has been completed.

The No Action Alternative and all action alternatives include goals and objectives to protect wilderness values for the Bruneau-Jarbidge Rivers Wilderness and to maintain or enhance the Outstandingly Remarkable Values (ORVs), free-flowing condition, and water quality of designated, suitable, and eligible Wild and Scenic River segments. Generally, achieving ORVs would support achievement of riparian goals and objectives, which would improve and maintain riparian and instream conditions to levels which fully support the habitat requirements for special status fish in the Bruneau River and Jarbidge River watersheds.

Impacts from Management Common to All Action Alternatives

All action alternatives include management direction to maintain or improve special status fish and aquatic species habitat. Implementing these priorities would improve PFC ratings and would promote the attainment of the habitat requirements for special status fish and aquatic invertebrate species. Although the rate of riparian and instream habitat improvement would vary between alternatives, all alternatives would identify habitats for special status fish and aquatic invertebrate species as a priority for restoration to levels which meet the needs for these species.

Impacts from Noxious Weeds and Invasive Plants Actions

Noxious weeds and invasive plants are often the first colonizers of disturbed areas. These species, in general, lack deep root systems which stabilize streambanks and maintain narrow stream channels. Noxious weeds and invasive plants can replace native vegetation (e.g., juniper encroachment prevents aspen and willow regeneration). Noxious weeds and invasive plants can alter soil stability, promote erosion, and affect the accumulation of leaf litter or other soil resources. Decreased soil stability can result in the formation of head cuts from overland flows causing lowering of the water table and loss of riparian plant species that retain water in soils. Where noxious weeds invade riparian areas, proper functioning condition (PFC) ratings decline, and the attainment of the riparian objectives is less likely to occur. However, management of riparian areas for PFC would result in a plant community with dense woody and herbaceous vegetation that would be more resistant to introductions and spreading of noxious weeds.

Noxious weed and invasive plant treatments can generally be described as chemical, mechanical, manual, or biological. When these treatments are used in riparian areas, their potential effects vary by the method used, the amount and type of vegetation treated, the amount of soil disturbed, the proximity of the treatment to water, and a variety of other factors (BLM, 2007c). Maintaining native vegetation in Riparian Conservation Areas (RCAs) is essential to maintaining riparian and wetland areas at PFC. Noxious weed and invasive plant treatments in RCAs are often necessary to reduce effects of noxious weeds and invasive plants on native riparian vegetation to the extent possible. The short-term effects of noxious weed and invasive plant treatments are generally less than the effects of allowing noxious weeds and invasive plants to displace native riparian vegetation over the long term.

The following indicator was used to analyze the impacts of Noxious Weeds and Invasive Plants actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in areas identified for noxious weed and invasive plant treatments.

Impacts from Management Specific to the No Action Alternative

Noxious weed treatments in riparian areas occupied by special status fish and aquatic invertebrate species are expected to reduce the potential for noxious weeds to increase to levels that would reduce PFC ratings. The management provided in the No Action Alternative to limit the risk of introduction or expansion of areas occupied by noxious weeds in RCAs is not expected to promote the attainment of objectives for Priority 1 and 2 reaches across the planning area. The management provided in the No Action Alternative is expected to locally reduce the occurrence of noxious weeds and invasive plants in RCAs. PFC ratings are expected to be maintained relative to the treatments used to reduce noxious weeds and invasive plants, but expected future increases in noxious weeds and invasive plants would continue to pose an increased risk of reducing these ratings over time.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All alternatives include management direction to follow applicable laws, policies, label instructions for the application of herbicides, and the current programmatic vegetation treatment direction, currently the Record of Decision for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (BLM, 2007b). The methods of control would be adjusted to minimize impacts to riparian areas and wetlands. Best management practices for noxious weed and invasive plants would be incorporated into BLM management activities and authorized uses as appropriate (Appendix B). Following direction in the Record of Decision for the Vegetation Treatment EIS would mitigate the potential for impacts to riparian areas and wetlands due to noxious weed and invasive plant treatments.

All alternatives would also comply with the Clean Water Act, which would provide direction to ensure chemicals that would harm non-target riparian vegetation and water quality would not be used in a manner that would have short- or long-term adverse effects on riparian areas and wetlands.

Impacts from Management Common to All Action Alternatives

For all action alternatives, the management direction for riparian areas and wetlands would reduce the potential for noxious weed treatments to adversely affect non-target vegetation in RCAs. The management is expected to promote the attainment of riparian objectives.

Impacts from Management Specific to Alternative I

Chemical, mechanical, and biological treatments and targeted grazing would be used to treat noxious weeds and invasive plants in RCAs. The emphasis areas would include RCAs occupied by special status fish and aquatic invertebrate species, recreation access points, and special designations.

Alternative I would have an estimated 250,000 acres of noxious weed and invasive plant treatments over the life of the plan, which is more than the No Action Alternative. The treatment of noxious weeds and invasive plants in RCAs is expected to promote the attainment of riparian objectives for Priority 1 and 2 reaches.

The use of targeted grazing to treat noxious weeds and invasive plants may locally impact riparian conditions depending on intensity and timing of grazing. Although the purpose of the treatment would be to reduce noxious weeds in RCAs, livestock would also browse non-target vegetation such as willows, carex, and sedges. This can result in a decrease in riparian vegetation and streambank stability prior to achieving the objectives for reducing noxious weeds and invasive plants. The timing of the treatments and monitoring would ensure yearly weed production is reduced while not impairing the yearly growth of the desirable riparian vegetation. However, since targeted grazing could not be implemented to only remove the noxious weeds and invasive plants without resulting in impacts to non-targeted herbaceous and woody hydric vegetation the use of targeted grazing in RCAs would require site specific mitigations to promote the attainment of objectives for Priority 1 and 2 reaches.

Impacts from Management Specific to Alternative II

Chemical, mechanical, and biological methods, as well as targeted grazing and prescribed fire, would be used to treat noxious weeds and invasive plants (estimate of 250,000 acres). The priority areas for treating noxious weeds and invasive plants would be riparian areas, special status species habitat, and

native plant communities. Noxious weed and invasive plant treatments in RCAs reduce the risk for these plants to outcompete native riparian vegetation and would promote attainment of riparian objectives for Priority 1 and 2 reaches, although some treatment methods could locally reduce native riparian vegetation. The effects of noxious weed and invasive plant treatments are similar to those described for Alternative I, with the additional risk for impacts due to the use of prescribed fire.

The effects from using targeted grazing to reduce fuels in RCAs are the same as described for Alternative I. Alternative II differs from Alternative I in that prescribed fire would be allowed to treat noxious weeds and invasive plants in RCAs. Prescribed fire has similar effects on the landscape as wildland fire, although the effects can be less pronounced because they are planned ignitions and are conducted according to specific project guidelines and environmental conditions. The use of prescribed fire in riparian areas would reduce PFC ratings because the fire would remove non-target vegetation. These effects could persist over the long term (5 to 10 years) because woody riparian vegetation recovers much slower than herbaceous vegetation (Burton, 2005; Rieman and Clayton, 1997). Site-specific analysis would be conducted prior to using prescribed fire in RCAs to control noxious weeds and invasive plants. Using prescribed fire to reduce noxious weeds and invasive plants in RCAs is not expected to promote the attainment of objectives for Priority 1 and 2 reaches in the short term but may achieve riparian objectives in some riparian reaches in the long term.

Impacts from Management Specific to Alternative III

Chemical, mechanical, and biological methods, as well as targeted grazing and prescribed fire, would be used for noxious weed treatments. The priority areas for treating noxious weed and invasive plants would be special designations, fuel breaks, areas with high wildland fire occurrences, areas around historic structures, roadsides, and riparian areas containing special status fish and aquatic invertebrate species. Fewer acres of noxious weeds would be treated under Alternative III (estimate of 200,000 acres), which could result in an incremental increase in noxious weeds and invasive plants in RCAs over time. An increase in noxious weeds in RCAs would reduce PFC ratings and the likelihood for riparian areas to be moving toward or achieving riparian objectives. Noxious weed and invasive plant treatments in RCAs reduce the risk for these plants to outcompete native riparian vegetation and would promote objectives for Priority 1 and 2 reaches, although some treatment methods have the potential to locally reduce native riparian vegetation.

The effects of noxious weed and invasive plant treatments in RCAs are the same as described in Alternative I. The potential effects from using targeted grazing and prescribed fire to reduce weeds in RCAs are the same as described under Alternatives I and II, respectively. Modifying uses in RCAs would reduce the introduction of noxious weeds and invasive plants into RCAs and the need for treatments that would impact non-target riparian vegetation and reduce PFC ratings.

Impacts from Management Specific to Alternative IV

Chemical, mechanical, and biological methods as well as targeted grazing and prescribed fire would be used to treat noxious weeds and invasive plants. The priority areas for treating noxious weed and invasive plants would be special designations, riparian areas, special status species habitat, and native plant communities. This alternative would have the greatest number of weed treatment acres (estimated 450,000 acres) over the life of the plan of any of the action alternatives. The effects of these treatments in RCAs are the same as described for Alternatives I and II, except the effects would occur over a larger area. Noxious weed and invasive plant treatments in RCAs reduce the risk for these plants to outcompete native riparian vegetation and would promote management objectives for riparian areas to be moving toward PFC. Some of the treatment methods, such as prescribed fire and targeted grazing, have the potential to reduce native riparian vegetation and may not promote the attainment of riparian objectives in the short and long term.

Impacts from Management Specific to Alternative V

Chemical, mechanical, and biological methods; seeding and planting; removal of livestock grazing; and prescribed fire would be used to treat noxious weeds and invasive plants. The priority areas for treating noxious weed and invasive plants would be special designations, riparian areas, special status species habitat, and native plant communities. This alternative would have noxious weed treatments on an

estimated 300,000 acres over the life of the plan, which is fewer acres treated than Alternative IV, but more than Alternatives I, II, III, and VI. The emphasis areas and treatment methods are similar to those described for Alternative IV, except that targeted grazing would not be used. The effects of these treatments in RCAs are the same as those described under Alternatives I and II, except there would be no impacts related to targeted grazing. Noxious weed and invasive plant treatments in RCAs would reduce the risk for these plants to outcompete native riparian vegetation and would promote the attainment of riparian objectives for Priority 1 and 2 reaches.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Chemical, mechanical, and biological methods, seeding and planting, targeted grazing, and prescribed fire, would be used to treat noxious weeds and invasive plants. The priority areas for treating noxious weed and invasive plants would be special designations, motorized and recreational access points, riparian areas, special status species habitat, roadsides, recreation areas, and native plant communities. There would be approximately 200,000 acres of noxious weeds treated, which is the same as for Alternative III. An increase in noxious weeds in RCAs would reduce PFC ratings and the likelihood for riparian areas to be moving toward or achieving riparian objectives. Noxious weed and invasive plant treatments in RCAs would reduce the risk for these plants to outcompete native riparian vegetation and would promote objectives for Priority 1 and 2 reaches, although some treatment methods have the potential to locally reduce native riparian vegetation.

The effects of noxious weed and invasive plant treatments in RCAs are the same as described in Alternative I. The effects from using targeted grazing and prescribed fire to reduce fuels in RCAs are the same as described under Alternatives I and II. Modifying uses in RCAs would reduce the introduction of noxious weeds and invasive plants into RCAs and the need for treatments that would locally impact non-target riparian vegetation and reduce PFC ratings.

Impacts from Wildland Fire Ecology and Management Actions

Riparian areas are often resilient to the effects of wildland fire when they are functioning properly and have adequate vegetation. These areas may burn in a wildland fire, but with low to moderate intensity. The areas of most concern in this analysis are those riparian reaches currently not at proper functioning condition (PFC). The susceptibility of these riparian areas to wildland fire effects may also vary by location in a watershed and size of the riparian area or wetland. The ecological diversity of riparian areas is maintained by natural disturbances regimes (Dwire and Kauffman, 2003; Naiman et al., 1993), including wildland fire, fire-related flooding, debris flows, and landslides. In some cases, wildland fire may improve riparian areas and wetlands by releasing nitrogen and facilitating additional growth for vegetation. Floods following wildland fires may result in both the erosion of established floodplains as well as the deposition of varied substrates and large wood where succession or stand establishment begins anew. These events create complex patterns of soil morphology and groundwater dynamics that influence riparian plant and animal communities (Dwire, 2001; Gregory et al., 1991; Otting, 1999). The regeneration of aspen clones, cottonwood, and willows are promoted by light severity fire. These plant species are well adapted to the effects of wildland fire.

Wildland fire or other disturbances can reduce the vigor of resident plants and their ability to resist invasion, or alter environmental conditions to favor invaders (King and Grace, 2000). The larger perimeter-to-area ratio of small burns can make areas more vulnerable to invasion by noxious weeds and invasive plants than with larger wildland fires (Turner et al., 1997). This is related to dispersal capabilities of these plants in riparian areas. Riparian burns tend to be “spotty” due to an elevated water table in the riparian area and the presence of water-loving plants, which also raise the water table in riparian areas through their deep root masses and transpiration. Promoting or suppressing wildland fire can change the functionality and dynamics of entire ecosystems (Richardson et al., 2000; Vitousek, 1990). Fire history studies have concluded that both frequency and severity of wildland fires are lower in riparian areas than adjacent uplands (Morrison and Swanson, 1990; Teensma, 1987; Weisberg, 1998). The presence of noxious weeds, which are effective at colonizing disturbed areas, are a threat to riparian vegetation and may facilitate more frequent wildland fire in riparian areas and wetlands than historically occurred.

Impacts from human alterations associated with wildland fire suppression, as summarized in the literature (Backer et al., 2004), include soil compaction, erosion, and reduced riparian productivity from fire camps, fire lines, helibases, incident command posts, road construction, and non-native plant species introductions. Prescribed fire used to reduce fuels may have impacts to riparian ecosystems similar to low-severity wildland fires. Such impacts may include reductions in riparian vegetation in the short term followed by immediate re-vegetation responses following wildland fire.

Critical suppression areas represent the highest wildland fire suppression priority. Alternatives that identify critical suppression for riparian areas and wetlands would reduce the potential for wildland fire impacts to these habitats. Conditional suppression areas, which represent areas of lower suppression priority based on the resource values and a desired fire role in the ecosystem, can result in unsuppressed wildland fire in Riparian Conservation Areas (RCAs); this can result in a short- or long-term reduction in PFC ratings followed by a long-term improvement in PFC ratings after vegetation has recovered. Priority 1 and 2 reaches are most at risk from the effects of wildland fire because of their impaired riparian function and therefore would benefit from being in a critical suppression area. These riparian areas with reduced PFC ratings are more susceptible to increased burn severity than riparian areas that are functioning properly. Priority 1 and 2 reaches in conditional suppression areas would be more at risk if there are multiple wildland fire starts and suppression resources are focused in other priority areas.

The following indicator was used to analyze the impacts of Wildland Fire Ecology and Management actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in critical suppression areas.

These reaches are at an increased risk for wildland fire and wildland fire suppression-related impacts due to their reduced condition. The Priority 1 and 2 reaches within conditional suppression areas are more at risk for impacts from wildland fire than the Priority 1 and 2 reaches within critical suppression areas. Conversely, the more miles of PFC rated reaches within critical suppression areas, the fewer risk for impacts to riparian and instream conditions.

Table 4-100 displays the miles of PFC priority reaches in critical suppression areas by Vegetation Management Area (VMA).

Table 4-100. Priority Reaches in Critical Suppression Areas by Vegetation Management Area by Alternative (Miles)

Priority Rating	Alternative [A]						
	I	II	III	IV		V	VI
				IV-A	IV-B		
VMA A							
Priority 1	1	1	1	1	1	1	1
Priority 2	7	7	7	7	7	7	7
Priority 3	10	10	10	10	10	10	10
Total	**18**	**18**	**18**	**18**	**18**	**18**	**18**
VMA B							
Priority 1	14	3	7	14	14	20	3
Priority 2	3	3	3	3	3	18	3
Priority 3	17	1	17	17	17	17	17
Total	**34**	**7**	**27**	**34**	**34**	**55**	**23**
VMA C							
Priority 1	12	6	10	12	11	15	10
Priority 2	0	0	0	2	1	13	2
Priority 3	13	1	13	14	14	21	13
Total	**25**	**7**	**23**	**28**	**26**	**49**	**25**

Priority Rating	Alternative [A]						
	I	II	III	IV		V	VI
				IV-A	IV-B		
VMA D							
Priority 1	21	8	19	34	24	39	22
Priority 2	10	6	10	22	13	25	10
Priority 3	18	11	13	36	23	36	19
Total	**49**	**25**	**42**	**92**	**60**	**100**	**51**
Entire Planning Area							
Priority 1	48	18	37	61	50	75	36
Priority 2	20	16	20	34	24	63	22
Priority 3	58	23	53	77	64	84	59
Total	**126**	**57**	**110**	**172**	**138**	**222**	**117**

[A] The No Action Alternative does not identify critical or conditional suppression areas.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative manages the planning area for full suppression of all wildland fires. Large wildland fires and human-caused fires are expected to continue due to factors that are beyond human control (i.e., drought conditions, weather, and availability of flashy fuels). Within the Bruneau-Jarbidge Rivers Wilderness and Wild and Scenic River (WSR) designations, wildland fire suppression tactics would not impair Wilderness or WSR values, which would also avoid impacts to riparian and instream conditions within these areas. However, limitations to suppression tactics may result in an increase in acres burned that would likely increase adverse impacts to riparian conditions. Outside of these special designations, the No Action Alternative provides general management direction for wildland fire suppression, fuels treatments, and emergency stabilization and burned area rehabilitation relative to protecting watershed and riparian conditions. This management direction is expected to reduce wildland fire suppression-related impacts to PFC ratings which would promote the attainment of the goals and objectives for riparian areas and wetlands.

Impacts from Management Common to All Action Alternatives

All action alternatives would use the management for riparian areas and wetlands to reduce impacts from wildland fire suppression in riparian areas and wetlands. The riparian areas and wetlands objectives to improve riparian and instream condition ratings, as supported by the priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5), would reduce the impacts from wildland fire suppression on riparian areas and improve riparian and instream conditions. The potential for short- and long-term impacts to riparian areas would still occur due to wildland fire; however, the effects from suppression activities would be reduced.

Wildland fire suppression operations would use minimum impact suppression tactics (MIST) to minimize impacts to riparian areas due to wildland fire suppression. Management actions, such as drafting water from streams in a manner that does not cause localized dewatering and avoiding fueling, staging, and other fire support areas in RCAs, would minimize the potential effects from wildland fire suppression activities on riparian areas and wetlands.

All action alternatives would include fuels treatments to reduce the threat for wildland fire to impact the wildland urban interface. Fuels treatments in riparian areas would have short-term adverse impacts to riparian and instream conditions but may result in long-term improvements in riparian vegetation in areas that are not at PFC. Degraded riparian areas may not respond in a similar manner because they tend to burn with greater severity and take longer to recover. The goals, objectives, and management actions for riparian areas, best management practices (BMPs), and Endangered Species Act (ESA) consultation would reduce the potential for fuels treatments to affect riparian areas containing special status species. Rest from authorized uses such as livestock grazing and recreation use would further promote the recovery of RCAs after fuels treatments.

A variety of mechanical, chemical, and manual methods would be used to restore vegetation and stabilize soils in burned areas. Management action, BMPs, and compliance with ESA consultations where required

would reduce impacts to PFC ratings from emergency stabilization and burned area rehabilitation projects. Some localized short-term impacts to PFC ratings would occur, but are not expected to result in an extensive decrease in PFC ratings for the burned area in the long term.

Impacts from Management Specific to Alternative I

For this alternative, 215 miles of perennial streams are in critical suppression areas and 102 miles of perennial streams are in conditional suppression areas. Critical suppression areas contain 48 miles of Priority 1 reaches, 20 miles of Priority 2 reaches, and 58 miles of Priority 3 reaches. Conditional suppression areas contain 29 miles of Priority 1 reaches, 43 miles of Priority 2 reaches, and 27 miles of Priority 3 reaches. Alternative I would have fewer miles of Priority 1 and 2 reaches at risk for impacts from wildland fire due to their inclusion in critical suppression areas than Alternatives IV and V but more than the other alternatives. This alternative would rank third in risk to riparian and instream condition due to their inclusion in conditional suppression areas of all alternatives; more risk than Alternatives IV and V but less than the other alternatives.

VMA C has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. Critical suppression areas in VMA C contain 12 miles of Priority 1 reaches, no miles of Priority 2 reaches, and 13 miles of Priority 3 reaches. In Alternative I, VMA C has the third highest amount of Priority 1 and 2 reaches in critical suppression areas of the four VMAs; more than for Alternatives II and III but less than the other alternatives.

The impacts to RCAs from implementing actions to improve water availability for wildland fire suppression (i.e. water storage tanks, draft sites, hydrants off pipelines, and enlarging stock water and surface water storage ponds) depend on their proximity to the riparian areas and wetlands, the amount of water used, the condition of the RCA, and the rate and time of year surface waters are diverted. The development of new draft sites from rivers and streams could have localized effects to streamside vegetation, streambanks, streambed fine sediments, pool quality, and the amount of surface flows if water is diverted during low flow conditions or at a rate that locally reduces surface flows. Management direction for wildland fire suppression activities, such as MIST, would be used to reduce the potential for these actions to impact riparian and instream condition. Although there would be localized impacts to riparian and instream conditions, they are not expected to occur at levels that would reduce PFC ratings in the long term. The use or expansion of stock water, hydrants off pipelines, and water storage ponds in upland areas to enhance the availability of water for wildland fire suppression would have few, if any, impacts to riparian or instream conditions. For Alternative I, the impacts to riparian areas due to actions to increase water availability would be the same as Alternatives II, III, and IV, greater than Alternative V, but less than Alternative VI.

Actions to improve access for wildland fire suppression are expected to increase the miles of road in RCA and the number of streams crossings within the planning area. The primary effect of roads on streams is from sediment contributions that exceed the stream's ability to transport the additional fine sediments and the removed of streamside vegetation which stabilizes streambanks. Improved road surfacing, road realignment away from riparian areas and wetlands, improved road drainage, or replacing damaged riparian vegetation would reduce sediment contributions to streams where roads are present in RCAs. Road improvements in RCAs would have localized short-term impacts that ultimately lead to long-term improvements in PFC rating for riparian areas and wetlands. Where new roads are created within RCAs, the impacts to PFC ratings would be greatest where the road crosses the stream channel. Management direction for stream crossings would include upgrading culverts or replacing culverts with bridges and would result in long-term benefits to riparian areas and wetlands. Creating new stream crossings would be consistent with riparian management direction to maintain or improve PFC ratings. Site-specific and short-term effects to PFC ratings from wildland fire-related road improvements would occur, but road improvements could ultimately improve instream habitats in the long term if fewer miles of riparian areas are burned. As new roads and stream crossings are created, the potential for increased use by public land users would have an additive effect to PFC ratings within and downstream of the road crossing in the long term. Impacts due to actions to improve access for wildland fire suppression would be the same as Alternative II, less than Alternatives III and VI, but more than Alternatives IV and V.

Actions to reduce the risk for wildland fire by reducing the amount of fine vegetative fuels would include targeted livestock grazing in RCAs, similar to those described under *Impacts from Noxious Weeds and Invasive Plants Actions*. In general, using livestock to treat fuels in RCAs would increase the amount of livestock browsing on non-target native hydric species and would pose an increased risk to reduce PFC ratings within the treatment area. Use of targeted grazing in RCAs would be expected to increase impacts desirable riparian vegetation, particularly in VMAs B and D which contain the majority of Priority 1 and 2 reaches in the planning area. The use of temporary infrastructure, such as fences and water sources outside of the RCA, would reduce but not completely eliminate the potential for impacts to RCAs. Impacts to riparian conditions due to actions to reduce fine fuels would be less than Alternatives II, III, IV, and VI, but more than Alternative V.

Impacts from Management Specific to Alternative II

For this alternative, critical suppression areas would include 88 miles of perennial streams and the conditional suppression areas would include 229 miles of perennial streams. Critical suppression areas contain 18 miles of Priority 1 reaches, 16 miles of Priority 2 reaches, and 23 miles of Priority 3 reaches. Conditional suppression areas contain 57 miles of Priority 1 reaches, 46 miles of Priority 2 reaches, and 62 miles of Priority 3 reaches. Alternative II has the fewest miles of Priority 1 and 2 reaches in critical suppression areas of all alternatives. It would pose the greatest risk for impacts to riparian and instream conditions during multiple ignitions of all alternatives.

VMA A has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. Critical suppression areas in VMA A contain 1 mile of Priority 1 reaches, 7 miles of Priority 2 reaches, and 10 miles of Priority 3 reaches, which is the same for all alternatives. VMA A is the northernmost VMA in the planning area and has the least amount of Priority 1 and 2 reaches of the four VMAs. Focusing wildland fire suppression efforts in this VMA during multiple ignitions would pose an increased risk to priority reaches within other VMAs with more miles Priority 1 and 2 reaches.

Creating new and improving existing water developments to aid in wildland fire suppression would have the same effects to riparian and instream conditions as described for Alternative I. Improving roads and stream crossings for wildland fire suppression and building new roads in areas with limited access, would have the same effects to riparian and instream conditions as Alternative I.

Alternative II would include the use of prescribed fire, targeted grazing, and increased permitted livestock grazing to reduce fuels. These fuels treatment methods would pose an increased risk to riparian and instream condition, particularly in Priority 1 and 2 reaches. The impacts of using livestock to reduce vegetative fuels would be the same as Alternative I. Prescribed fire has similar, but less pronounced, effects on the landscape as wildland fire because prescribed fires are planned ignitions and conducted according to specific project objectives (e.g., fire intensity, acreages, and weather conditions). Where prescribed fire occurs in the RCA, PFC ratings would be locally reduced because the fire would reduce or remove riparian vegetation. The effects to woody riparian vegetation would be expected to be long-term (5 to 10 years) because woody riparian vegetation recovers more slowly than herbaceous riparian vegetation (Burton, 2005; Rieman and Clayton, 1997). Once the woody riparian vegetation has recovered, PFC ratings may be improved compared to their pre-burn condition.

Impacts from Management Specific to Alternative III

For this alternative, critical suppression areas would encompass 170 miles of perennial streams and conditional suppression areas would encompass 148 miles of perennial streams. Critical suppression areas contain 37 miles of Priority 1 reaches, 20 miles of Priority 2 reaches, and 53 miles of Priority 3 reaches. Conditional suppression areas contain 39 miles of Priority 1 reaches, 43 miles of Priority 2 reaches, and 32 miles of Priority 3 reaches. This alternative would have the second fewest miles of Priority 1 and 2 reaches in critical suppression areas; more than Alternative II but less than the other alternatives. It would rank second in risk for impacts to PFC ratings due to wildland fire of all alternatives.

VMA B has the highest priority for wildland fire suppression during multiple ignitions, while VMA A has the second highest priority. Critical suppression areas in VMA B contain 7 miles of Priority 1 reaches, 3 miles of Priority 2 reaches, and 17 of miles Priority 3 reaches. The VMA includes lower portions of Clover Creek

(intermittent or dry), middle sections of the Bruneau River, and lower sections of Salmon Falls Creek before its confluence with the Snake River. For Alternative III, VMA B has the second most miles of Priority 1 and 2 reaches in critical suppression areas of the four VMAs.

The effects of wildland fire management for critical and conditional suppression areas on PFC ratings are similar to Alternative I, although more miles of Priority 1 and 2 reaches would be at risk for impacts due to their inclusion in conditional suppression areas. The difference for Alternative III is the increased amount of infrastructure that would be constructed to support wildland fire suppression activities which would pose an increased risk for adverse impacts to PFC ratings.

This alternative would have the most new infrastructure to increase water availability for wildland fire suppression of all alternatives. The effects of creating new upland water storage tanks, draft sites, hydrants off pipelines, enlarging stock water and surface water storage ponds, are similar to but more than those described for Alternative I. The development of new pipelines within RCAs would result in localized disturbance to streamside vegetation, streambeds, and streambank stability which would locally impact PFC ratings. Applying the riparian areas and wetland management direction to maintain or improve PFC ratings would reduce impacts, but localized impacts to riparian and instream condition would occur. New pipelines in uplands are not expected to impact PFC ratings.

This alternative would have the most miles of new roads, improvements to existing roads, and new stream crossings to facilitate wildland fire suppression of all alternatives; it would pose the greatest risk for impacts to PFC ratings due to these activities. The impacts of improving existing roads and stream crossings and building new roads are similar, but would be more than those described for Alternative I because there would be more miles of roads and more stream crossings.

Fuels treatment methods would include increased permitted livestock grazing, targeted grazing, and prescribed fire. These treatments would have similar impacts to PFC ratings as described for Alternative I, but because more acres could be treated more impacts would be expected for Alternative III. Impacts for these actions are also described under *Impacts from Livestock Grazing Actions* and *Impacts from Noxious Weeds and Invasive Plants Actions*.

Impacts from Management Specific to Alternative IV

In Alternative IV-A, critical suppression areas would encompass 253 miles of perennial streams and the conditional suppression areas would include 65 miles of perennial streams. In Alternative IV-B, critical suppression areas would encompass 226 miles of perennial streams and condition suppression areas would encompass 92 miles of perennial streams. More Priority 1 and 2 reaches would be in critical suppression areas in the Jarbidge Foothills Area of Critical Environmental Concern (ACEC) in Alternative IV-A than in Alternative IV-B. Critical suppression areas in the Inside Desert ACEC would result in less risk for impacts to Priority 1 and 2 reaches due to wildland fire in portions of lower Clover Creek in Alternative IV-A compared to Alternative IV-B.

Critical suppression areas in Alternative IV-A contain 61 miles of Priority 1 reaches, 34 miles of Priority 2 reaches, and 77 miles of Priority 3 reaches. Conditional suppression areas contain 15 miles of Priority 1 reaches, 29 miles of Priority 2 reaches, and 8 miles of Priority 3 reaches. This alternative has the third most miles of Priority 1 and 2 reaches in critical suppression areas of all the alternatives; less than the No Action Alternative and Alternative V but more than the other alternatives.

Critical suppression areas in Alternative IV-B contain 50 miles of Priority 1 reaches, 24 miles of Priority 2 reaches, and 64 miles of Priority 3 reaches. Conditional suppression areas contain 25 miles of Priority 1 reaches, 40 miles of Priority 2 reaches, and 21 miles of Priority 3 reaches. This alternative has the fourth most miles of Priority 1 and 2 reaches in critical suppression areas of all alternatives; less than the No Action Alternative and Alternatives IV-A and V but more than the other alternatives.

VMA C has the highest priority for wildland fire suppression during multiple ignitions while VMA D has the second highest priority. Critical suppression areas in VMA C contain 12 miles of Priority 1 reaches, 2 miles of Priority 2 reaches, and 14 miles of Priority 3 reaches; miles of Priority 3 reaches in critical suppression areas in VMA C are the same in Alternative IV-B, with 1 less mile in Priority 1 and Priority 2

reaches. For Alternative IV, VMA C would rank third in the miles of Priority 1 and 2 reaches in critical suppression areas of the four VMAs.

As in the other action alternatives, there would be an increased emphasis on improving water sources, roads and stream crossings, and other infrastructure to enhance wildland fire suppression with similar effects as described for Alternative I. However, water developments would only consist of hydrants off pipelines and enlarging stock water and surface water storage ponds. The effects from these facilities are similar to those described for Alternative I but slightly less due to limitations on the types of water developments that would be constructed.

The effects of using prescribed fire and targeted grazing for fuels reduction are similar to Alternative I, except Alternative IV would include more acres of fuels treatments over the life of the plan. Not all of these treatment acres would be in RCAs, but riparian areas would be an emphasis for these treatments. Impacts to RCAs from fuels treatment are also described under *Impacts from Noxious Weeds and Invasive Plants Actions*.

Impacts from Management Specific to Alternative V

Critical suppression areas would encompass 304 miles of perennial streams and the conditional suppression areas would encompass 13 miles of perennial streams. Critical suppression areas in the Sagebrush Sea ACEC would encompass 259 miles perennial stream. The critical suppression emphasis is expected to reduce the potential for wildland fire to reduce PFC ratings. However, identifying critical suppression for such a large area may limit wildland fire suppression options during multiple wildland fire ignitions when flexibility with suppression resources is needed to protect other high priority areas and resources.

Critical suppression areas contain 75 miles of Priority 1 reaches, 63 miles of Priority 2 reaches, and 84 miles of Priority 3 reaches. This is the most miles of Priority 1 and 2 reaches within critical suppression of all alternatives. Conditional suppression areas in Alternative V contain less than one mile of Priority 3 reaches. Alternative V would have the fewest risk for impacts to Priority 1 and 2 reaches due to their inclusion in critical suppression areas of all alternatives.

As in Alternative I, VMA C has the highest priority for wildland fire suppression during multiple ignitions in Alternative V, while VMA B has the second highest priority. Critical suppression areas in VMA C contain 15 miles of Priority 1 reaches, 13 miles of Priority 2 reaches, and 21 miles of Priority 3 reaches. For Alternative V, VMA C has the third most miles of Priority 1 and 2 reaches in critical suppression areas of the four VMAs.

This alternative would have less wildland fire suppression infrastructure and less watershed disturbance due to suppression and prevention (water availability, access, and fuels treatments) than any of the other action alternatives. It would pose the fewest risks for impacts to Priority 1 and 2 reaches of all alternatives due to these activities. Water developments would be maintained at their current levels, which would result in fewer disturbances to RCAs and less risk for impacts to PFC ratings than for the other action alternatives. However, maintaining water availability at current levels would not improve response time for wildland fire suppression which would result in more acres burned by wildland fire than if water availability access for wildland fire suppression was improved. This would pose an increased risk for wildland fire to occur within RCAs, reducing PFC ratings in the short and long term. The effects of road and stream crossing improvements are the same as described for Alternative I.

The effects of using prescribed fire for fuels treatments on Priority 1 and 2 reaches are the same as Alternative I; impacts are also described under *Impacts from Noxious Weeds and Invasive Plants Actions*.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Critical suppression areas would encompass 200 miles of perennial streams and the conditional suppression areas would have 117 miles of perennial streams. Critical suppression areas contain 36 miles of Priority 1 reaches, 22 miles of Priority 2 reaches, and 59 miles of Priority 3 reaches. This alternative has one more mile of Priority 1 and 2 reaches within critical suppression areas than Alternative III. Conditional suppression areas contain 39 miles of Priority 1 reaches, 42 miles of Priority 2 reaches,

and 26 miles of Priority 3 reaches. Alternative VI would have the third fewest miles of Priority 1 and 2 reaches in critical suppression areas of all alternatives; more than Alternatives II and III but less than the other alternatives.

VMA C would have highest priority for wildland fire suppression when multiple wildland fire ignitions occur. Critical suppression areas in VMA C contain 10 miles of Priority 1 reaches, 2 miles of Priority 2 reaches, and 13 miles of Priority 3 reaches. For Alternative VI, VMA C has the second most miles of Priority 1 and 2 reaches in critical suppression areas of the four VMAs.

The impacts to PFC ratings from infrastructure improvements would be similar to Alternative I, but the amount and type of improvements would be similar to Alternative III. The effects of improving existing roads and stream crossings and constructing new roads and crossings would be the same as described for Alternative I, but the area impacted would be greater and more similar to Alternative III.

The impacts to PFC ratings from the use of prescribed fire, targeted grazing, and increased permitted livestock grazing to reduce fuels would be similar to but more than Alternative I; the amount of applied treatments would be similar to Alternative III. Impacts to riparian and instream conditions for these treatments are similar to those described under *Impacts from Noxious Weeds and Invasive Plants Actions*; the impacts of using increased permitted livestock grazing to reduce fuels are described under *Impacts from Livestock Grazing Actions*.

Impacts from Livestock Grazing Actions

Livestock can alter the structure and function of riparian plant communities by grazing, browsing, and trampling. The quantity and composition of plant species as well as the quantity and depth of plant roots can be affected. Livestock can also change the vertical structure and distribution of vegetation, as selective removal or trampling damage can alter age structure of plant communities (Kauffman and Krueger, 1984; Popolizio et al., 1994). Riparian areas where livestock have access and the proper functioning condition (PFC) data indicate a reduced condition (Priority 1 and 2 reaches) are the areas at most risk for impacts from livestock grazing.

Streambank shape, soil composition, and gradient are the primary drivers of a stream's hydrological function. Streambanks are the interface between instream characteristics (e.g., flow) and terrestrial characteristics (e.g., riparian vegetation). Excessive livestock trampling can break down streambanks, resulting in lower (flattened) bank angles, a reduction in bank undercutting (Platts, 1991), and accelerated bank erosion. Bank sloughing by livestock can influence the erosion-deposition cycle by accelerating soil erosion (bank degradation) and decreasing deposition on streambanks (bank building) during flood events, largely due to removal of vegetative cover (Platts, 1991). Transport of soils and fine organic material away from the site decreases the fertility of the soils and can reduce capacity to support vegetation of any type (Brady, 1984), resulting in riparian degradation.

The vegetation component of certain streamside habitat types responds more quickly to improved management practices than other components such as streambank morphology (Platts, 1991). A combination of trampling and browsing by livestock can alter the structure of willow populations. Schulz and Leininger (1991) reported that willows were both older and larger in a 30-year exclosure compared with a grazed area, indicating cattle browsing had affected both the age structure and size of the plants. However, some species of willows improve from browsing by stimulating auxiliary growth. Drummond willow (*Salix drummondiana*) and Booth willow (*Salix boothii*) depend on newly developed gravel bars, freshly broken banks, or seasonal sediment deposition (Winward, 1986) and thrive where there are natural disturbances. These willow species are early colonizers and would promote the stability and recovery of disturbed areas. Browsing can affect riparian trees, primarily by reducing or eliminating regenerating trees, mainly aspen (*Populus tremuloides*) and cottonwood (*Populus trichocarpa*). Skovlin (1984) concluded that the impacts of heavy and/or uncontrolled cattle grazing on shrubs and trees were primarily from the damage to the regenerative stage (new annual growth) of woody plants.

Riparian reference areas closed to livestock grazing allow for comparisons for future evaluation of livestock grazing impacts on public lands. These areas create a representative sample of ecosystem

components, vegetation types, and elevation gradients. Excluding livestock from these areas allows for the evaluation of changes in stream channels. Livestock exclusion is associated with a decrease in the width-to-depth ratio, which is strongly associated with quality of habitat for fish, particularly for salmonids. Platts (1991) found that once grazing ceased, streambanks rebuilt rapidly, and streams were significantly narrower inside a rested exclosure than stream reaches outside the exclosure.

Fencing to exclude livestock grazing from streams is a widely used approach for restoring stream habitats (Platts, 1991). Properly constructed and maintained exclosure fences protect riparian vegetation and streambanks from livestock grazing and other effects (e.g., recreation, off-highway vehicles, and other vehicle access). Research shows that riparian areas quickly improve when they are fenced to exclude grazing. A 10-year riparian grazing study on a cold mountain meadow riparian system in central Idaho found that stream channels narrowed, stream width-to-depth ratios were reduced, and channel substrate embeddedness decreased under a no grazing, light grazing (20% to 25%), and medium grazing (35% to 50%) system (Clary, 1999). Streambank stability increased, and streamside willow communities increased in both height and cover under all three grazing treatments. Virtually all stream channel measurements improved when pastures were not grazed. Many of the similar improvements indicated these riparian habitats are compatible with light to medium late-spring use by cattle (Clary, 1999). Other grazing strategies can also be compatible with riparian habitats needs (Platts, 1991).

The following indicator was used to analyze the impacts of Livestock Grazing actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in areas available for livestock grazing.

Table 4-101 displays the miles of priority reaches in areas available and unavailable for livestock grazing by alternative.

Table 4-101. Priority Reaches in Areas Available and Unavailable to Livestock Grazing by Alternative (Miles)

Priority Rating	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Available								
Priority 1	51	40	41	41	40	40	26	40
Priority 2	54	40	52	52	40	41	31	43
Priority 3	40	36	39	39	37	37	20	38
Total	**145**	**116**	**132**	**132**	**117**	**118**	**77**	**121**
Unavailable								
Priority 1	25	36	35	35	36	36	50	36
Priority 2	9	23	11	11	22	21	32	20
Priority 3	45	48	45	45	48	48	64	46
Total	**79**	**107**	**91**	**91**	**106**	**105**	**146**	**102**

The process for identifying riparian reference areas is provided in Appendix O. The riparian reference areas are expected to improve PFC ratings which would support the achievement or movement towards riparian objectives for Priority 1 and 2 reaches under all action alternatives.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would have an allocation of between 160,000 to 260,000 animal unit months (AUMs) for livestock at full implementation. There are 125 miles of perennial streams in areas available and 192 miles of perennial streams in areas unavailable for livestock grazing. Of the perennial streams available for grazing, 51 miles are Priority 1, 54 miles are Priority 2, and 40 miles are Priority 3. Of the streams unavailable for grazing, 25 miles are Priority 1, 9 miles are Priority 2, and 45 miles are Priority 3. The No Action Alternative has the most miles of perennial stream and miles of Priority 1 and 2 reaches in areas available for grazing of all alternatives. The No Action Alternative would pose the most risk for

impacts to riparian condition due to livestock grazing of all alternatives. It would rank fourth in the number of authorized AUMs at full implementation of the alternatives; less than Alternatives II, III, and VI but more than the other alternatives.

Five riparian exclosures which encompassed approximately 10 miles of stream were created to exclude livestock grazing under the No Action Alternative. Riparian conditions within these exclosures are expected to continue to improve over the long term.

Impacts from Management Common to All Action Alternatives

Livestock grazing would comply with the riparian and wetland goals and management actions to improve riparian condition. This direction would be used in grazing authorizations and operating plans to adjust livestock grazing in areas identified as priority areas for improvement based on PFC ratings displayed in Appendix D (Tables D-3, D-4, and D-5). This management is expected to improve PFC ratings in stream reaches where livestock grazing is reducing riparian and instream conditions.

Impacts from Management Specific to Alternative I

This alternative would authorize an approximate range of 179,000 to 245,000 AUMs for livestock grazing at full implementation if vegetation objectives are achieved. There would be 94 miles of perennial streams in areas available and 224 miles of perennial streams in areas unavailable for livestock grazing. The areas available for grazing include 40 miles of Priority 1 reaches, 40 miles of Priority 2 reaches, and 36 miles of Priority 3 reaches; the areas unavailable for grazing include 36 miles of Priority 1 reaches, 23 miles of Priority 2 reaches, and 48 miles of Priority 3 reaches. The areas unavailable for grazing would also include ten riparian reference areas, encompassing approximately 3,000 acres. The riparian areas that are Priority 1 and 2 reaches and are available for livestock grazing are at an increased risk for impacts due to grazing, while the Priority 1 and 2 reaches unavailable for grazing are at a reduced risk for impacts and are more likely to move toward or achieve riparian objectives. Alternative I would have more miles of Priority 1 and 2 reaches in areas available to livestock grazing and would pose more risk to impacts to riparian conditions than Alternative V; it would have the same risks for impacts to riparian condition as Alternative IV-A, but fewer than the other alternatives. Similar to Alternative IV-A, it would pose the second fewest risk for impacts to riparian condition of all alternatives. Alternative I would rank fifth of the alternatives in the number of authorized AUMs at full implementation once vegetation objectives are met.

Livestock grazing would not occur in Riparian Conservation Areas (RCAs) in the Jarbidge River and its East Fork, but would occur in the smaller tributaries to the Jarbidge Foothills streams. Grazing in these areas would contribute fine sediments to riparian areas and wetlands. Except in riparian reference areas and where limited by topography, livestock would have access to riparian areas and wetlands in the Jarbidge Foothills. Livestock would not have direct access to riparian areas containing special status species in the lower Bruneau River and the Snake River due to existing Endangered Species Act consultation requirements. Livestock grazing impacts to PFC ratings would be more than in Alternative V, but less than in the other alternatives.

Temporary non-renewable (TNR) permits for livestock grazing would be allowed except in pastures in the Bruneau-Jarbidge Rivers Wilderness, the riparian pasture of the Lower Saylor Creek Allotment, and in the Sand Point Area of Critical Environmental Concern. Any TNR permits issued in RCAs would occur according to riparian areas and wetlands objectives to maintain or improve PFC ratings. Livestock have an increased tendency to select woody vegetation late in the grazing season after the herbaceous vegetation has cured. Issuing TNR permits late in the grazing season would pose an increased risk to woody vegetation in riparian areas and wetlands and would require the use of site specific woody use standards to maintain or improve the condition of woody vegetation. These habitats can also be affected by issuing TNR permits in upland areas unless upland water is provided and temporary fencing is used to prevent livestock from accessing the RCAs.

Impacts from Management Specific to Alternative II

This alternative would authorize an approximate range of 362,000 to 440,000 AUMs for livestock grazing at full implementation if vegetation objectives are achieved, which is the most of all alternatives. In

Alternative II, 111 miles of perennial streams would be in areas available and 206 miles would be in areas unavailable for livestock grazing. The areas available for grazing include 41 miles of Priority 1 reaches, 52 miles of Priority 2 reaches, and 39 miles of Priority 3 reaches; the areas unavailable for grazing include 35 miles of Priority 1 reaches, 11 miles of Priority 2 reaches, and 45 miles of Priority 3 reaches. Areas unavailable for grazing also include ten riparian reference areas, encompassing approximately 1,000 acres.

The effects of this alternative are similar to but more than those described for Alternative I due to more authorized AUMS and more miles of riparian area available to grazing along Clover Creek and the Snake River. Alternative II would have fewer miles of Priority 1 and 2 streams in areas available to livestock grazing than the No Action Alternative; it would have the same miles as Alternative III which is more miles than the other alternatives. Similar to Alternative III, it would pose the second greatest risk for impacts to riparian conditions of all alternatives.

Reserve common allotments would be selected based on special management concerns, such as riparian areas containing special status fish and aquatic invertebrate species and whether the area can sustain grazing use without significant resource impacts. The designation of reserve common allotments would provide flexibility for post-wildland fire rest of burned areas, post-treatment rest of emergency stabilization and burned area rehabilitation areas, and proactive vegetation treatments. The ability to rest areas burned by wildland fire from livestock grazing is expected to increase the rate of vegetative and riparian recovery for the affected areas.

The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Management Specific to Alternative III

This alternative would authorize an approximate range of 276,000 to 348,000 AUMs for livestock grazing at full implementation if vegetation objectives are achieved. For Alternative III, the miles of perennial streams, the miles of Priority 1 and 2 reaches in areas available for livestock grazing, and the number and size of riparian exclosures would be the same as Alternative II; the impacts would be similar to Alternative II which poses the second most risk for impacts to riparian condition. Alternative III would allocate fewer AUMs for livestock grazing at full implementation that Alternative II, which would result in slightly fewer impacts to riparian areas than would be expected for Alternative II but more than for the other alternatives.

The effects of creating reserve common allotments are the same as described for Alternative II. The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Management Specific to Alternative IV

Alternative IV-A would authorize an approximate range of 78,000 to 123,000 AUMs for livestock grazing at full implementation if vegetation objectives are achieved. Under Alternative IV-A, 96 miles of perennial streams would be in areas available and 221 miles would be in areas unavailable for livestock grazing. In Alternative IV-B, 97 miles of perennial streams would be available and 220 miles would be unavailable for livestock grazing. The difference between Alternatives IV-A and IV-B is one mile of stream in Clover Creek.

The areas available for grazing include 40 miles of Priority 1 reaches (Alternatives IV-A and IV-B), 40 miles and 41 miles of Priority 2 reach for Alternatives IV-A and IV-B respectively, and 37 miles of Priority 3 reaches for both Alternatives IV-A and IV-B; the areas unavailable for grazing include 36 miles of Priority 1 reaches, 21 and 22 miles of Priority 2 reaches for Alternatives IV-A and IV-B, and 43 miles of Priority 3 reaches. The alternatives differ by one mile of Priority 2 stream; the impacts to riparian areas are essential the same for both alternatives. Areas unavailable for grazing (for both alternatives) include ten riparian reference areas (up to 3,000 acres); the same as for Alternatives I and VI.

Alternative IV would have more miles of Priority 1 and 2 reaches in areas available to livestock grazing than Alternative V but less than the other alternatives. Alternatives I, IV-A, and IV-B would pose essentially the same risk for impacts to riparian areas as they only vary by one mile of Priority 2 reach. The impacts to riparian conditions for these alternatives vary by the number of authorized AUMs at full

implementation. Alternative IV-A would have the second fewest authorized AUMS; more than Alternative V but less than the other alternatives. Alternative IV-B would have slightly more AUMs than Alternative IV-A. Alternative IV would have the second fewest authorized AUMs at full implementation of all alternatives. It would pose the second least risk for impacts to riparian conditions due to livestock grazing.

The effects of creating reserve common allotments are the same as described for Alternative II. The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Management Specific to Alternative V

This alternative would authorize an approximate range of 42,000 to 85,000 AUMs for livestock grazing at full implementation if vegetation objectives are achieved, which is the least of all alternatives. Under Alternative V, 58 miles of perennial streams would be available and 260 miles would be unavailable for livestock grazing. Alternative V would have the fewest perennial stream miles available to livestock grazing of all alternatives. The areas available for grazing include 26 miles of Priority 1 reaches, 31 miles of Priority 2 reaches, and 20 miles of Priority 3 reaches; the areas unavailable for grazing include 50 miles of Priority 1 reaches, 32 miles of Priority 2 reaches, and 64 miles of Priority 3 reaches. Areas unavailable for grazing include six riparian reference areas (up to 23,000 acres), which is the most of all alternatives. Alternative V would have the fewest miles of Priority 1 and 2 reaches in areas available for livestock grazing of all alternatives. Based on the low miles of Priority 1 and Priority 2 stream available for livestock grazing, the increased acreage of riparian reference areas, and the low number of AUMs at full implementation, Alternative V would pose the least risk for impacts to riparian condition of all alternatives. It is the most likely to achieve riparian objectives relative to livestock grazing of all alternatives.

Reserve common allotments would not be created in Alternative V; instead, forage on acquired lands and in allotments where permits are relinquished or cancelled would be held over the life of the plan for wildlife habitat and watershed protection, increasing the likelihood for improvements in riparian condition.

Impacts from Management Specific to Alternative VI (Proposed RMP)

This alternative would authorize an approximate range of 186,000 to 279,000 AUMs for livestock grazing at full implementation if vegetation objectives are achieved. For Alternative VI, 100 miles of perennial streams would be in areas available and 217 miles would be in areas unavailable for livestock grazing. The areas available for grazing include 40 miles of Priority 1 reaches, 43 miles of Priority 2 reaches, and 38 miles of Priority 3 reaches; the areas unavailable for grazing include 36 miles of Priority 1 reaches, 20 miles of Priority 2 reaches, and 46 miles of Priority 3 reaches. Areas unavailable for grazing also include ten riparian reference areas; these riparian reference areas would have the same acres as Alternatives I and IV which is more than would occur in Alternatives II and III, and less than Alternative V. Alternative VI would have fewer miles of Priority 1 and 2 reaches in areas available to livestock grazing than the No Action Alternative and Alternatives II and III. It would rank third in risk for impacts to Priority 1 and 2 reaches in areas available to livestock grazing of all alternatives. Alternative VI would also rank third in the number of authorized AUMs at full implementation; less than Alternatives II and III but more than the other alternatives.

The effects of creating reserve common allotments are the same as described for Alternative II. The effects of issuing TNR permits in riparian areas are the same as described for Alternative I.

Impacts from Recreation Actions

Human activities that may disrupt riparian vegetation in dry desert environments include the creation and use of trails associated with hiking, horse riding, and cycling; vehicle activities both on and off roads; camping associated with developed and dispersed recreation; and boating and wave activity affecting shorelines (Clark and Gibbons, 1991). These activities can result in the removal, trampling, and compaction of riparian vegetation, especially when they occur over an extended period of time in a localized area such as an accessible water source. Recreation activities in Riparian Conservation Areas (RCAs) can reduce proper functioning condition (PFC) ratings and reduce the likelihood of attaining or moving toward riparian objectives. Disturbance associated with cross-country motorized vehicle use can alter plant community composition or create openings in vegetation cover on shorelines (Quigley and

Arbelbide, 1997). This can affect soil and water filtration and provide avenues for noxious weeds and invasive plants to invade riparian areas.

The following indicator was used to analyze the impacts of Recreation actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in Special Recreation Management Area (SRMA) and Extensive Recreation Management Area (ERMA) management designations.

Establishing SRMAs would provide management emphasis that would include the identification of mitigations for addressing recreation impacts to riparian areas and wetlands. Table 4-102 displays the miles of priority reaches in SRMAs and ERMAs by alternative. SRMA and ERMA management, which would be consistent with riparian management goals and objectives, is expected to reduce recreation-related impacts to riparian areas and improve riparian condition to be moving toward or achieving riparian objectives.

Table 4-102. Priority Reaches in Special & Extensive Recreation Management Areas by Alternative (Miles)

Priority Rating	Alternative [A]					
	I	II	III	IV	V	VI[B]
Priority 1	46	7	7	19	6	85
Priority 2	24	0	0	5	0	48
Priority 3	42	2	3	16	1	81
Total	**112**	**9**	**10**	**40**	**7**	**214**

[A] SRMA boundaries were not delineated for the No Action Alternative.
[B] Alternative VI is the only alternative with ERMAs and the miles include reaches in both SRMAs and ERMAs.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes limited direction for managing recreation impacts in riparian areas. The only management objective for recreation is to protect Salmon Falls Creek Canyon and portions of the Jarbidge River. There is limited direction for managing recreation uses to avoid impacts to wetlands. The No Action Alternative management is expected to maintain the current riparian condition and PFC ratings relative to impacts from recreational activities.

Impacts from Management Common to All Action Alternatives

All action alternatives include management actions to protect riparian resources while enhancing recreation opportunities. Recreation activities in riparian areas would follow riparian areas and wetlands management to reduce recreation-related impacts to riparian areas and wetlands by reducing impacts from existing recreation sites and avoiding the construction of new recreation sites in RCAs unless a site-specific analysis determines the riparian objectives can be met. This management is expected to promote the attainment of Priority 1 and 2 reaches moving toward or achieving PFC over the life of the plan.

The localized impacts to riparian vegetation in SRMAs would likely be reduced due to increased SRMA management emphasis. Monitoring recreation use would ensure that impacts to riparian areas would not increase to levels that reduce PFC ratings or prevent the attainment of riparian management objectives.

Impacts from Management Specific to Alternative I

This alternative would have 123 miles of perennial streams in seven SRMAs. The SRMAs would include 46 miles of Priority 1 reaches, 24 miles of Priority 2 reaches, and 42 miles of Priority 3 reaches. The more miles of Priority 1 and 2 reaches in SRMAs the less risk for recreation impacts to occur at levels that reduce the condition of these areas over the life of the plan. Alternative I would have the most miles of Priority 1 and 2 reaches in SRMAs of all action alternatives and would have the greatest likelihood to reduce recreation-related impacts to Priority 1 and 2 reaches due to SRMA management; similar to Alternative VI.

Impacts from Management Specific to Alternative II

This alternative would have 17 miles of perennial streams in three SRMAs. The SRMAs would include seven miles of Priority 1 reaches, no Priority 2 reaches, and two miles of Priority 3 reaches. Alternative II would have the second fewest miles of Priority 1 and 2 reaches in an SRMA; more than Alternative V but less than the other alternatives. Alternative II, similar to Alternative III, would have the third greatest likelihood for reducing recreation-related impacts to Priority 1 and 2 reaches due to SRMA management. It would be more likely to reduce recreation-related impacts than the No Action Alternative and Alternative V but less likely than for Alternatives II, IV, and VI.

Impacts from Management Specific to Alternative III

For this alternative, there would be 19 miles of perennial streams in five SRMAs. The SRMAs would include seven miles of Priority 1 reaches, no Priority 2 reaches, and three miles of Priority 3 reaches. Alternative III has the same miles of Priority 1 and 2 reaches in SRMAs as Alternative II. As a result, the impacts are the same as for Alternative II.

Impacts from Management Specific to Alternative IV

This alternative would have 58 miles of perennial streams in four SRMAs. The SRMAs would include 19 miles of Priority 1 reaches, 5 miles of Priority 2 reaches, and 16 miles of Priority 3 reaches. Alternative IV has more miles of Priority 1 and 2 reaches in an SRMA than Alternatives II, III, and V but fewer than Alternatives I and VI. Alternative IV would have the second highest miles of Priority 1 and 2 reaches in an SRMA of all alternatives. It would have the second greatest likelihood for reducing recreation-related impacts to Priority 1 and 2 reaches of all alternatives; less than Alternatives I and VI but more than for the other alternatives.

Impacts from Management Specific to Alternative V

This alternative would have seven miles of perennial streams in two SRMAs. The SRMAs would include six miles of Priority 1 reaches, no Priority 2 reaches, and one mile of Priority 3 reaches. Except for the No Action Alternative, Alternative V has the fewest miles of Priority 1 and 2 reaches in SRMAs of all alternatives. As a result, riparian areas with a reduced PFC rating due to existing recreation impacts would not be included in an SRMA and therefore are less likely to be improved due to SRMA management. The effects on PFC ratings would be similar to but slightly less than Alternatives II and III.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would have 123 miles of perennial streams under SRMA or ERMA management. There would be 14 miles of perennial streams in six SRMAs. The SRMAs would include 46 miles of Priority 1 reaches, 24 miles of Priority 2 reaches, and 42 miles of Priority 3 reaches. Alternative VI has the same miles of Priority 1 and 2 reaches in a SRMA as Alternative I, which is the most of all alternatives. As a result, Alternative VI, similar to Alternative I, would have the greatest likelihood for reducing recreation-related impacts to Priority 1 and 2 reaches due to their inclusion in a SRMA.

The four ERMAs allocated in Alternative VI would include 109 miles of perennial streams; these perennial miles are in addition to the 14 perennial miles allocated within a SRMA. The ERMAs would be located in the Jarbidge Foothills, Canyonlands, Rosevear, and at Luds Point. The ERMAs include 39 miles of Priority 1 reaches, 24 miles of Priority 2 reaches, and 39 miles of Priority 3 reaches. The increased emphasis on recreation management would reduce the risk for impacts to Priority 1 and 2 reaches and improve riparian conditions within these ERMAs. The combined effect of six SRMAs and four ERMAs would be the most improvement in PFC ratings due to a reduction in recreation-related impacts of all alternatives.

Impacts from Transportation and Travel Actions

Roads and stream crossings can be a major source of sediment to streams, resulting from channel fill around culverts and subsequent road crossing failures. Sediment in the stream can lead to physical alterations in channel morphology, such as increased channel braiding, increased width-to-depth ratios, and increased incidence and severity of streambank erosion (Furniss et al., 1991). Unnatural channel width, slope, and other stream channel characteristics can occur upstream and downstream of stream

crossings. Roads can alter hill slope hydrology by reducing soil infiltration, concentrating water through road drainage structures, and converting subsurface flow to surface flow (Luce and Black, 1999).

Road construction, use, and maintenance near streams often remove riparian vegetation which stabilizes streambanks and shades the stream. Mass soil movements and channel changes resulting from roads can also eliminate or damage riparian vegetation and reduce the input of large woody debris to the stream channel, which is important for maintaining channel stability, hydrological functions, floodplain development, and habitat complexity in streams (Furniss et al., 1991). There are 216 miles of road in Riparian Conservation Areas (RCAs), which have locally reduced proper functioning condition (PFC) ratings due to contributing fine sediment to riparian areas and locally removing riparian vegetation. Road use restrictions in RCAs would result in the most improvement to riparian areas and wetlands, particularly where PFC ratings indicate there are reduced riparian conditions. Transportation and travel restrictions in upland areas can also improve riparian and wetlands at the watershed scale if they result in less soil disturbance and surface erosion and therefore less sediment entering RCAs.

Cross-country motorized vehicle use increases the risk of impacts to riparian vegetation, sediment introduction to streams, and localized impacts to water quality, which results in a reduced PFC rating. Over time, the number and length of cross-country routes is expected to increase in areas open to cross-country motorized vehicle use. Motorized cross-country use in RCAs would locally reduce PFC ratings.

The following indicator was used to analyze the impacts of Transportation and Travel actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in areas with open and limited travel designations.

The areas of most concern in this analysis are stream reaches not at PFC currently (i.e., Priority 1 and 2 reaches) in areas open to cross-country motorized vehicle use or with limited travel designations. These areas are at an increased risk for not attaining or moving toward riparian objectives. Riparian and instream conditions in areas closed to motorized vehicle use are more likely to attain or move toward riparian area and wetlands objectives.

Table 4-103 contains the miles of Priority 1, 2, and 3 reaches by travel designation.

Table 4-103. Priority Reaches by Travel Designation by Alternative (Miles)

Priority Reaches	Alternative						
	No Action	I	II	III	IV	V	VI
Open to Cross-Country Motorized Vehicle Use							
Priority 1	17	0	0	0	0	0	0
Priority 2	18	0	0	0	0	0	0
Priority 3	23	< 1	0	< 1	< 1	< 1	< 1
Total	**58**	**< 1**	**0**	**< 1**	**< 1**	**< 1**	**< 1**
Limited to Designated Routes or Seasonal Restrictions [A]							
Priority 1	29	27	27	27	23	22	27
Priority 2	18	21	23	23	20	19	23
Priority 3	30	32	41	41	38	29	41
Total	**77**	**80**	**91**	**91**	**81**	**70**	**91**
Limited to Designated Routes (Motorized and Mechanized Off-Highway Vehicles)							
Priority 1	15	34	34	34	34	33	34
Priority 2	27	40	40	40	40	40	40
Priority 3	4	16	16	16	16	15	16
Total	**46**	**88**	**90**	**90**	**90**	**88**	**90**

Priority Reaches	Alternative						
	No Action	I	II	III	IV	V	VI
Closed to Motorized and Mechanized Vehicle Use							
Priority 1	15	16	15	15	20	21	15
Priority 2	0	2	0	0	2	4	0
Priority 3	28	38	28	28	31	41	28
Total	**43**	**56**	**43**	**43**	**53**	**66**	**43**

[A] In the No Action Alternative, these miles are limited to designated routes.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 68 miles of perennial streams are in areas open to cross-country motorized vehicle use. Open areas contain 17 miles of Priority 1 reaches, 18 miles of Priority 2 reaches, and 23 miles of Priority 3 reaches, the most of any alternative. No Action Alternative would pose the most risk for impacts to priority reaches due to areas open to cross-country motorized vehicle use of all alternatives.

The areas with travel limited to designated routes or by seasonal restrictions would include 135 miles of perennial streams. Within these areas, there are 123 miles of PFC rated streams; 89 miles are Priority 1 and 2 reaches and 30 miles of Priority 3 reaches, the fewest of any alternative. Limiting motorized vehicle use to designated routes or with seasonal restrictions has provided little protection for riparian areas and wetlands as is evident by the increase in the number of roads in RCAs since the 1987 Jarbidge RMP. The increase in route density is primarily due to a substantial increase in all-terrain vehicle and off-road motorcycle use, which enabled public land users to pioneer roads into areas previously not accessible by four-wheel drive vehicles. The effect to riparian areas is an increase in the number of stream crossings, increased sediment contributions to riparian areas and wetlands from existing and new roads, increased recreational use in RCAs, localized loss of riparian vegetation and reduction in riparian condition, an increase in the spread of noxious weeds into riparian areas, and an increased incidence of human-caused fires. All of these have contributed to the reduced PFC ratings where roads are present in RCAs. The direction under the No Action Alternative provides no direction for reducing route density, eliminating duplicate roads (i.e., roads with same destination), reducing road surface erosion to streams, or improving stream crossings to reduce effects to riparian areas and wetlands.

There would be 115 miles of perennial streams are in areas closed to motorized and mechanized vehicle use. The closed areas contain 15 miles of Priority 1 reaches, no Priority 2 reaches, and 28 miles of Priority 3 reaches. The No Action Alternative, similar to Alternatives II, III, and VI, would have the fewest miles of PFC rated streams and Priority 1 and 2 reaches in areas closed to motorized and mechanized travel. Similar to Alternatives II, III, and VI, the No Action Alternative would have more miles of priority reaches in areas with limited travel designations than Alternatives IV and V.

Impacts from Management Common to All Action Alternatives

Travel management activities in riparian areas would include direction to improve riparian and instream conditions as supported by the restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5) to reduce impacts from existing roads and for avoiding construction of new roads in RCAs unless a site-specific analysis indicates short-term effects would result in the achievement of riparian areas and wetland objectives in the long term. This is expected to improve PFC ratings and promote attaining or moving riparian areas and wetland objectives.

Developing a Travel Management Plan would provide a site-specific analysis to identify road closures, travel restrictions, or other travel management adjustments to reduce impacts to RCAs. Short-term reductions in PFC ratings and long-term improvements to riparian and instream conditions would occur as a result of road improvement projects, culvert replacements, route closures, and road rehabilitation. The potential for effects to riparian areas from roads in RCAs would continue until treatment actions are completed and riparian vegetation has recovered.

Impacts from Management Specific to Alternative I

The areas open to cross country travel would be in the Deadman/Yahoo Special Recreation Management Area (SRMA); the rest of the planning area would be closed to motorized cross-country travel. The SRMA would encompass less than one mile of perennial stream which is Priority 3 reach. The effects of cross-country travel on PFC ratings across large portions of the planning area would be reduced to less than one mile within the SRMA. Management for the SRMA would maintain PFC ratings within the SRMA. Even though motorized cross-country travel would not be authorized in RCAs, exceptions may be granted to BLM permit, lease, or right-of-way (ROW) holders or may be allowed on a case-by-case basis for non-BLM government entities. Cross-country motorized vehicle use in RCAs or wetlands would locally reduce PFC ratings. Localized impacts to RCAs would be expected from allowing game retrieval using motorized vehicles within 300 feet of designated routes except in closed areas. Motorized cross-country travel 25 feet off designated routes to access a camp site is less likely to affect PFC ratings as it would not be allowed in RCAs.

The areas with travel limited to designated routes or by seasonal restrictions would encompass 179 miles of perennial streams. These areas include 168 miles of PFC rated streams; 122 miles are Priority 1 reaches and 48 miles are Priority 3 reaches. Limiting motorized and mechanized travel to designated routes or with seasonal restrictions would poses less risk to PFC ratings than areas open to motorized cross-country travel since travel occurs on an already-disturbed surface. Erosion and physical disturbance to stream channels could be reduced through adjustments in road design criteria, maintenance, location and seasonal restrictions. However, roads in RCAs impact PFC ratings in the short and long term. Alternative I would have more miles of Priority 1 and 2 reaches in areas with travel limited designations than the No Action Alternative and Alternatives IV and V, but fewer miles than Alternatives II, III, and VI. Limiting travel at Yahoo Creek would reduce the potential for motorized recreation to degrade PFC ratings where roads occur in RCAs. Alternative I would rank second in miles of Priority 1 and 2 reaches in areas with limited travel designations of all alternatives.

Areas closed to motorized and mechanized vehicle use would include 137 miles of perennial streams. Within these areas, there are 16 miles of Priority 1 reaches, 2 miles of Priority 2 reaches, and 38 miles of Priority 3 reaches. Alternative I would have more miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use than the No Action Alternative and Alternatives II, III, and VI and fewer than Alternatives IV and V. Transportation-related impacts to PFC ratings would decrease in these reaches. As described above, road-related impacts may still occur if roads in closed areas are not reclaimed, although the impacts would be less than if the road was still in use.

Relative to the No Action Alternative, the travel designations for Alternative I would promote Priority 1 and 2 reaches moving towards or achieving PFC over the life of the plan. These changes would also maintain Priority 3 reaches and ensure their condition is not reduced due to travel-related impacts.

Alternative I would establish five Travel Management Areas (TMAs). Route density is expected to increase in one TMA (41,000 acres), remain the same in one TMA (667,000 acres), and decrease in three TMAs (664,000 acres). Any changes in route density could affect PFC ratings in RCAs. This alternative would decrease route density on more acres than Alternatives II and III, but fewer acres than Alternatives IV, V, and VI. In general, a decrease in route density in riparian areas would reduce effects to riparian areas and wetlands and promote movement towards or achievement of riparian areas and wetlands objectives.

Impacts from Management Specific to Alternative II

The widely occurring impacts from cross-country motorized vehicle use on riparian and instream conditions would no longer occur because the planning are would not be open to cross-country motorized vehicle use. However, localized impacts to PFC ratings may occur as Alternative II would allow for game retrieval off designated routes, but not within areas closed to motorized vehicle use; and would allow motorized cross-country travel 100 feet off designated routes to access a camp site, but not within areas closed to motorized vehicle use or in riparian areas.

The areas with travel limited to designated routes or by seasonal restrictions would encompass 213 miles of perennial streams. These areas include 181 miles of PFC rated streams; 124 miles are Priority 1 and 2 reaches and 57 miles are Priority 3 reaches. Alternative II would have the same amount of Priority 1 and 2 reaches in areas with limited travel designations as Alternatives III and VI, but more miles than the No Action Alternative and Alternatives I, IV, and V. The impacts of travel limited designations for Alternative II are similar to those described for Alternative I, except more miles of Priority 1 and 2 reaches would be in areas with limited travel designations in Alternative II.

Areas closed to motorized and mechanized vehicle use would include 104 miles of perennial streams. These areas contain 15 miles of Priority 1 reaches, no Priority 2 reaches, and 28 miles of Priority 3 reaches. Alternative II would have the same amount of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use as the No Action Alternative and Alternatives III and VI, but fewer miles than the other action alternatives. Impacts of this travel designation are similar to those described for Alternative I, except fewer miles of Priority 1 and 2 reach would be closed to motorized and mechanized vehicle use.

Relative to the No Action Alternative, the travel designations for Alternative II would promote Priority 1 and 2 reaches moving towards or achieving PFC over the life of the plan. These changes would also maintain Priority 3 reaches and ensure their condition is not reduced due to travel-related impacts.

Alternative II would establish two TMAs. Route density is expected to increase in one TMA (1,159,000 acres) and remain the same in the other TMA (213,000 acres). This is substantially more acres with increased route density than any of the other action alternatives; therefore, the risk for impacts to riparian areas would be greater than for the other action alternatives.

Impacts from Management Specific to Alternative III

The impacts from cross-country motorized vehicle use on PFC ratings are the same as described for Alternative I; however, the area impacted may decrease as Alternative III would not allow game retrieval off designated routes. Impacts to PFC ratings would be similar to but slightly less than Alternative I.

The areas with travel limited to designated routes or by seasonal restrictions would encompass 202 miles of perennial streams. These areas include the same miles of PFC rated streams miles of priority reaches as Alternatives II and VI; the impacts from limited travel designations are the same for all three alternatives. The impacts of travel limited designations for Alternative II are similar to those described for Alternative I, except more miles of Priority 1 and 2 reaches would be in areas with limited travel designations in Alternative III.

Areas closed to motorized and mechanized vehicle use would include 115 miles of perennial streams. These areas contain 15 miles of Priority 1 reaches, no Priority 2 reaches, and 28 miles of Priority 3 reaches. Alternative III would have the same miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use as the No Action Alternative and Alternatives II and VI, but fewer miles than the other action alternatives. Impacts of this travel designation are similar to those described in Alternative I, except fewer miles of Priority 1 and 2 reaches would be closed to motorized and mechanized use.

Relative to the No Action Alternative, the travel designations for Alternative III would promote Priority 1 and 2 reaches moving towards or achieving PFC over the life of the plan to a similar degree as in Alternative II. These changes would also maintain Priority 3 reaches and ensure their condition is not reduced due to travel-related impacts.

Alternative III would establish five TMAs. The effects of creating TMAs would be the same as for Alternative I. Route density is expected to increase in one TMA (34,000 acres) and remain the same in four TMAs (1,337,000 acres). There would be no reduction in route density because routes would be maintained for wildland fire suppression efforts. The result would be slower rates of recovery from road-related impacts to PFC ratings than would are expected for the other action alternatives, but a faster rate than the No Action Alternative.

Impacts from Management Specific to Alternative IV

The impacts from cross-country motorized vehicle use on PFC ratings are the same as described for Alternative I; however, the area impacted may decrease as Alternative IV would not allow game retrieval off designated routes. Impacts to PFC ratings would be similar to but slightly less than Alternative I.

The areas with travel limited to designated routes or by seasonal restrictions would encompass 195 miles of perennial streams. These areas include 171 miles of PFC rated streams; 117 miles are Priority 1 and 2 reaches and 54 miles of Priority 3 reaches. The impacts of travel limited designations for Alternative IV are similar to those described for Alternative I, except fewer miles of Priority 1 and 2 reaches would be in areas with limited travel designations. Alternative IV would have fewer miles of Priority 1 and 2 reaches in areas with limited travel designations than Alternatives I, II, III, and VI but more than the No Action Alternative and Alternative V.

Areas closed to motorized and mechanized vehicle use would include 123 miles of perennial streams. These areas contain 20 miles of Priority 1 reaches, 2 miles of Priority 2 reaches, and 31 miles of Priority 3 reaches. Alternative IV would have more miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use than the No Action Alternative and Alternatives I, II, III, and VI but fewer than Alternative V. Impacts of this travel designation are the same as described for Alternative I, except more miles of Priority 1 and 2 reaches would be in areas designated as closed to motorized and mechanized vehicle use.

Relative to the No Action Alternative, the travel designations for Alternative IV would promote Priority 1 and 2 reaches moving towards or achieving PFC over the life of the plan. These changes would also maintain Priority 3 reaches and ensure their condition is not reduced due to travel-related impacts.

Alternative IV would establish the same TMAs as Alternative I although the acres for each TMA vary slightly by alternative. Route density is expected to increase in one TMA (34,000 acres) and decrease in four TMAs (1,337,000 acres). This alternative is expected to result in the second greatest reduction in route density of all alternatives; slightly less than Alternative V but more than the other alternatives. Because Alternative IV emphasizes active restoration, it is likely more miles of road in RCAs would be improved or modified to reduce effects to PFC ratings than for the other alternatives. A reduction in route density would result in a long-term improvement in PFC ratings, even though there would be short-term localized reductions in PFC ratings from road improvements, relocations, or restoration activities. A reduction in route density would promote Priority 1 and 2 reaches achieving or moving toward PFC over the life of the plan. This alternative would have the most short-term impacts to PFC ratings and the fastest recovery of riparian areas from changes in travel designations than any other alternative.

Alternative IV, similar to Alternative VI, emphasizes active restoration and increases the likelihood that more miles of road in the RCA would be modified to reduce impacts to PFC ratings than in Alternatives I, II, III, and V. There would be short-term localized reductions in PFC ratings from road improvement, relocation, or restoration activities, but these activities are expected to improve PFC ratings in the long term. This alternative, similar to Alternative VI, would have the most short-term impacts and the fastest recovery of riparian and instream conditions related to transportation and travel than the other alternatives.

Impacts from Management Specific to Alternative V

Alternative V would have the least impacts from cross-country motorized vehicle use on PFC ratings compared to any other alternative, as no exceptions to motorized vehicle restrictions would be granted to permit, lease, and ROW holders or for game retrieval. Access to recreation sites would be limited within 25 feet of designated routes and would not be allowed in RCAs; the impacts to PFC ratings would be similar to but slightly less than Alternative I. The only area open to cross-country motorized vehicle use would be in the 700-acre Yahoo SRMA, which encompass less than one mile of Priority 3 reaches. Management would maintain the PFC rating within the SRMA.

The areas with travel limited to designated routes or by seasonal restrictions would encompass 172 miles of perennial streams. These areas include 158 miles of PFC rated streams; 114 miles are Priority 1 and 2

reaches and 44 miles are Priority 3 reaches. Alternative V would have the fewest miles of Priority 1 and 2 reaches in areas with travel limited designations of all action alternatives. The impacts from limited travel designations would be similar to those described for Alternative I, except fewer miles of Priority 1 and 2 reaches would be in areas with limited travel designations.

Areas closed to motorized vehicle use include 145 of perennial stream. These areas contain 21 miles of Priority 1 reaches, 4 miles of Priority 2 reaches, and 41 miles of Priority 3 reaches. Alternative V would have the most miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use of all alternatives. Impacts of this travel designation are the same as described for Alternative I, except more miles of Priority 1 and 2 reaches would be in areas closed to motorized and mechanized vehicle use.

Relative to the No Action Alternative, the travel designations for Alternative V would promote Priority 1 and 2 reaches moving towards or achieving PFC over the life of the plan. These changes would also maintain Priority 3 reaches and ensure their condition is not reduced due to travel-related impacts.

Alternative V would establish five TMAs. Route density under Alternative V is expected to increase in one TMA (3,000 acres) and decrease in four TMAs (1,368,000 acres). This is likely to result in a long-term improvement in riparian areas and wetlands as a primary source of sediment to RCAs would be reduced. There would be short-term decreases in PFC ratings from road improvements, relocations, or restoration activities, but the long-term improvements to PFC ratings from these activities are expected to out-weigh the short-term impacts. Alternative V would result in fewer restoration-related impacts to PFC ratings than under Alternative IV because passive techniques would be used for restoration. The passive restoration techniques would result in some areas not being fully restored because more aggressive techniques would not be used. The rate of recovery of some of the riparian areas with road closures would be slower than if active restoration was used to expedite the recovery process. Alternative V is expected to improve PFC ratings over a longer time period than Alternative IV. However, this alternative would result in a substantial reduction in route density over the life of the plan which would be expected to have a major reduction in road-related impacts to riparian areas and wetlands as well as instream conditions.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The impacts from cross-country motorized vehicle use on PFC ratings are the same as described for Alternative I; however, the area impacted would be slightly less as game retrieval off designated routes would not be allowed. The impacts to PFC ratings from motorized cross-country travel to access a camp site would be the same as Alternative II, except seasonal use restrictions would be applied if dispersed camping results in localized reductions in PFC ratings.

The areas with travel limited to designated routes or by seasonal restrictions would encompass the same miles of perennial stream, miles of PFC rated streams, and miles of priority reaches as Alternatives II and III; the impacts from limited travel designations are the same for all three alternatives. These alternatives have the most miles of Priority 1 and 2 reaches in areas with limited travel designations of all alternatives; more than for the No Action Alternative and Alternatives I, IV, and V. The impacts are similar to those described for Alternative I, except more miles of Priority 1 and 2 reaches would be in areas with limited travel designations.

Areas closed to motorized and mechanized vehicle use would include 115 miles of perennial streams. These areas contain 15 miles of Priority 1 reaches, no miles of Priority 2 reaches, and 28 miles of Priority 3 reaches. Alternative VI would have the same miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use as the No Action Alternative and Alternatives II and III which is less than the other alternatives. The impacts to Priority 1 and 2 reaches are the same for all four alternatives; more impacts to Priority 1 and 2 reaches than would be expected for Alternatives I, IV, and V.

Relative to the No Action Alternative, Alternative VI travel designations would promote Priority 1 and 2 reaches moving towards or achieving PFC over the life of the plan. These changes would also maintain Priority 3 reaches and ensure their condition is not reduced due to travel-related impacts.

Alternative VI would create five TMAs. Route density would be expected to increase on 34,000 acres in the planning area (1 TMA), decrease on 135,000 acres (1 TMA), and remain the same for 1,202,000 acres (3 TMAs). A portion of the changes in route density are likely to occur in areas that would impact PFC ratings. A reduction in route density would improve PFC ratings over the life of the plan. The impacts to riparian areas from TMAs are expected to be similar to Alternative III.

Alternative VI emphasizes active restoration and increases the likelihood that more miles of road in the RCA would be modified to reduce impacts to PFC ratings than in Alternatives I, II, and III. There would be short-term localized reductions in PFC ratings from road improvement, relocation, or restoration activities, but these activities are expected to improve PFC ratings in the long term. This alternative, similar to Alternative IV would have the most short-term impacts and the fastest recovery of riparian and instream conditions related to transportation and travel than for the other action alternatives.

Impacts from Land Use Authorizations Actions

The impacts from land use authorizations on riparian areas and wetlands vary by the type of authorization, season and duration of use, and proximity of use to riparian areas. Some uses such as powerlines, telephone lines, and communication sites in upland areas would have little or no impacts to riparian areas or wetlands. Other land use authorizations such as roads, water developments, ditches, wind energy infrastructure, and other surface-disturbing uses have potential to impact riparian conditions depending on their proximity to riparian areas and wetlands. The effects of land uses on riparian vegetation and the introduction of sediment into the stream channel are described under *Impacts from Riparian Areas and Wetlands Actions*, *Impacts from Transportation and Travel Actions*, and *Impacts from Livestock Grazing Actions*.

The following indicator was used to analyze the impacts Land Use Authorization actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in areas available for land use authorizations.

Table 4-104 contains the miles of priority reaches in right-of-way (ROW) avoidance areas, ROW exclusion areas, and areas available for ROWs by alternative.

Table 4-104. Priority Reaches in Right-of-Way Avoidance Areas, Exclusion Areas, and Areas Available for Rights-of-Way by Alternative (Miles)

Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
ROW Avoidance Areas							
Priority 1	58	58	58	58	58	75	75
Priority 2	50	50	50	50	50	56	56
Priority 3	67	67	67	67	67	82	82
Total	**175**	**175**	**175**	**175**	**175**	**213**	**213**
ROW Exclusion Areas							
Priority 1	15	15	15	15	19	21	15
Priority 2	0	0	0	0	2	4	0
Priority 3	28	30	28	30	33	43	30
Total	**43**	**45**	**43**	**45**	**55**	**68**	**45**
ROW Available Areas							
Priority 1	18	18	18	18	13	1	1
Priority 2	13	13	13	13	10	7	6
Priority 3	17	17	17	17	14	3	3
Total	**48**	**48**	**48**	**48**	**37**	**11**	**10**

[A] Described as “utility avoidance areas” in the No Action Alternative.

Impacts from utility ROW corridors include impacts from the powerlines, support towers, roads, and other structures. Utility ROW corridors pose the most risk to riparian conditions and proper functioning condition

(PFC) ratings where utilities are buried in Riparian Conservation Areas (RCAs) or where new roads are constructed to develop and maintain utility ROW corridors. The primary effects of utility ROW corridors on riparian areas occur where project-related roads enter RCAs. The effects of roads on riparian areas and the sediment they introduce into stream channels are described under *Impacts from Transportation and Travel Actions*.

Wind energy projects are an increasing use on public lands. Most of the infrastructure for wind developments, such as towers, support facilities, and associated powerlines, are located in upland areas or ridge tops and would have limited impacts to PFC ratings. The road systems that support wind developments, particularly those that occur within the RCA, have the greatest potential to impact PFC ratings for riparian areas and wetlands by altering stream channel characteristics, removing riparian vegetation, and locally reducing water quality. The use of culverts or bridges directly influences the long-term impacts to PFC ratings in and below areas where roads cross a stream. Wind developments can also have short-term impacts to instream flows if surface water is required for road construction or reconstruction, dust abatement on roads or equipment staging areas, or for mixing with concrete to construct tower foundations. The impacts to RCAs from removing surface water vary by location, season, amount, and rate of withdrawal and pose an increasing risk for impacts to PFC rating if water is removed from riparian areas over the long term. Table 4-105 displays the miles of priority reaches in expected wind energy development areas by alternative.

Table 4-105. Priority Reaches in Expected Wind Energy Development Areas by Alternative (Miles)

Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
Priority 1	15	< 1	16	3	< 1	< 1	1
Priority 2	5	1	8	1	1	1	5
Priority 3	5	< 1	13	1	< 1	< 1	1
Total	**25**	**1**	**37**	**5**	**1**	**1**	**7**

Impacts from Management Specific to the No Action Alternative

The ROW avoidance areas would encompass 248 miles of perennial streams. PFC ratings were completed on 175 miles of these streams; 108 miles are Priority 1 and 2 reaches. The No Action Alternative would have the same miles of Priority 1 and 2 reaches in ROW avoidance areas as Alternatives I, II, III, and IV; the impacts to riparian conditions are the same for these alternatives. The No Action Alternative, similar to Alternatives I, II, III, and IV, would pose more risk to riparian condition and Priority 1 and 2 reaches Alternatives V and VI.

ROW exclusion areas would encompass 104 miles of perennial streams in the Sand Point Area of Critical Environmental Concern (ACEC) and Bruneau-Jarbidge Rivers Wilderness. PFC ratings were completed on 43 miles of these streams; 15 miles are Priority 1 reaches, no Priority 2 reaches, and 30 miles of Priority 3 reaches. Impacts to riparian areas are not expected to occur within ROW exclusion because ROW would not be granted within these areas. The No Action Alternative, similar to Alternative II, would have the fewest miles of Priority 1 and 2 reaches in ROW exclusion areas of all alternatives.

There would be 69 miles of perennial streams in areas available for ROWs that are not within the ROW exclusion or ROW avoidance areas. PFC ratings were completed on 48 of these miles; 31 miles are Priority 1 and 2 reaches and would be at most risk for impacts to riparian condition due to ROW authorizations. The No Action Alternative would have the same miles of Priority 1 and 2 reaches within areas available for ROWs as Alternatives I, II, and III, which is the most of all alternatives. The No Action Alternative would have more risk for impacts to riparian condition than Alternatives IV, V, and VI.

Utility ROW corridors would encompass two miles of perennial streams, all of which have assessed for riparian condition; less than one mile is in Priority 1 and 2 reaches. The No Action Alternative would have the fewest miles of perennial streams and Priority 1 and 2 reaches within utility ROW corridors and would pose the fewest risk for impacts to riparian condition due to utility ROW development of all alternatives.

Expected wind energy development areas for the No Action Alternative contain 27 miles of perennial stream. For these streams, there are 15 miles of Priority 1 reaches, 5 miles of Priority 2 reaches, and 5 miles of Priority 3 reaches. This alternative has fewer miles of Priority 1 and 2 reaches in expected wind energy development areas than Alternative II but more miles than the other action alternatives. The No Action Alternative ranks second in risk for impacts to riparian conditions due to expected wind energy development areas.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The No Action Alternative and all action alternatives include programmatic policies and best management practices for wind energy development, which provides direction that would reduce impacts to riparian areas and wetlands from wind energy projects. The application of this direction is expected to reduce the risk for impacts to riparian areas and wetlands from wind energy development.

The No Action Alternative and all action alternatives include ROW exclusion areas where ROWs would not be authorized. Although the miles of perennial stream or PFC rated stream vary slightly between alternatives, impacts to riparian areas would not be expected to occur within these exclusion areas.

Impacts from Management Common to All Action Alternatives

New ROWs on public land would follow the riparian areas and wetlands management actions to improve PFC ratings and promote the attainment or movement toward achieving the riparian objectives in ROW avoidance areas, areas available for ROWs, utility ROW corridors, and in expected wind development areas. Management would maintain Priority 3 reaches and facilitate Priority 1 and 2 reaches achieving or moving toward PFC over the long term.

Impacts from Management Specific to Alternative I

ROW avoidance areas would encompass 248 miles of perennial streams. PFC ratings were completed on 175 miles of these streams; 108 miles are Priority 1 and 2 reaches. The miles of Priority 1 and 2 reaches in ROW avoidance areas are the same for the No Action Alternative and Alternatives I through IV; the risk for impacts to riparian areas would be the same for these alternatives. ROW avoidance areas that include Priority 1 and 2 reaches would facilitate these reaches achieving or moving towards PFC over the life of the plan. Alternative I would pose the same risk for impacts to Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, II, III, and IV, which is more than would be expected for Alternatives V and VI.

ROW exclusion areas would encompass 107 miles of perennial streams in the Sand Point ACEC, the Bruneau-Jarbidge Rivers Wilderness, and the Salmon Falls Creek Wilderness Study Area. PFC ratings were completed on 45 miles of these streams; 15 miles are Priority 1 reaches, no Priority 2 reaches, and 30 miles of Priority 3 reaches. Impacts to riparian areas are not expected to occur within ROW exclusion areas which would improve and maintain riparian areas at PFC relative to this use. Alternative I would have the same miles of Priority 1 and 2 reaches in ROW exclusion areas as the No Action Alternative and Alternatives II, III, and VI, which is less than for Alternatives IV and V.

This alternative would have the same miles of perennial streams and the same miles of Priority 1 and 2 reaches in areas available for ROWs as the No Action Alternative and Alternatives II and III. The risk for impacts to riparian condition and Priority 1 and 2 reaches is the same for all four alternatives; more than would be expected for Alternatives IV, V, and VI.

Utility ROW corridors would encompass eight miles of perennial streams. A majority of utility ROW corridors are located in upland areas and would have minor impacts, if any, to PFC ratings. The utility ROW corridors for Alternative I are the same as in Alternatives II, III, IV, and V, which is more than the No Action Alternative and Alternative VI.

Expected wind energy development areas encompass less than four miles of perennial streams along the Snake River from the Hagerman Fossil Beds National Monument to the town of Hammett and along Salmon Falls Creek below Salmon Falls Creek Dam. The expected wind energy development areas contain less than one mile of Priority 1 reaches, one mile of Priority 2 reaches, and less than one mile of

Priority 3 reaches. Alternative I would have the same miles of Priority 1 and 2 reaches in areas of expected wind energy development areas as Alternatives IV and V, which is less than the other alternatives. Alternative I, similar to Alternatives IV and V, would pose the least risk for impacts to riparian areas of all alternatives.

Impacts from Management Specific to Alternative II

ROW avoidance areas would include the same miles of perennial streams and Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, III, and IV. The risk for impacts to riparian condition are the same for these alternatives; more than would be expected for Alternatives V and VI.

ROW exclusion areas would encompass the same miles of perennial streams and the same miles of PFC rated streams as the No Action Alternative. The risks for impacts to riparian conditions are the same as described for the No Action Alternative.

Alternative II would have the same miles of perennial streams and the same miles of Priority 1 and 2 reaches in areas available for ROWs as the No Action Alternative and Alternatives I and III. The risk for impacts to riparian condition and Priority 1 and 2 reaches as the same for all four alternatives; more risk than would be expected for Alternatives IV, V, and VI.

The utility ROW corridors for are the same as Alternative I; the risk for impacts to riparian areas are the same as Alternative I.

Expected wind energy development areas would include the same areas for Alternative I but would also include a portion of the Jarbidge Foothills and upper Bruneau River near the Nevada state line. The expected wind energy development areas would encompass 40 miles of perennial streams. For these streams, there are 16 miles of Priority 1 reaches, 8 miles of Priority 2 reaches, and 13 miles of Priority 3 reaches. Alternative II has the most miles of Priority 1 and 2 reaches in the expected wind energy development areas and therefore would pose the greatest risk for impacts to riparian condition of all alternatives.

Impacts from Management Specific to Alternative III

ROW avoidance areas would include the same miles of perennial streams and Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, II, and IV. The risk for impacts to riparian condition are the same for these alternatives; more than would be expected for Alternatives V and VI.

ROW exclusion areas would be in the same locations and would encompass the same miles of Priority 1 and 2 reaches as described for Alternative I and VI. Similar to Alternatives I and VI, impacts to riparian conditions are not expected to occur due to the granting of ROWs within the ROW exclusion areas.

Alternative III would have the same miles of perennial streams and the same miles of Priority 1 and 2 reaches in areas available for ROWs as the No Action Alternative and Alternative II. The risk for impacts to riparian condition and Priority 1 and 2 reaches as the same for all four alternatives; more risk than would be expected for Alternatives IV, V, and VI.

Expected wind energy development areas would include eight miles of perennial streams in the same areas described for Alternative I but with additional areas of expected wind energy development near Cedar Creek reservoir and in the upper Salmon Falls Creek watershed near China Creek. The expected wind energy development areas contain three miles of Priority 1 reaches, one mile of Priority 2 reaches, and one mile of Priority 3 reaches. Alternative III would have more miles of Priority 1 and 2 reaches in areas of expected wind development than Alternatives I, IV, and V but less than the other alternatives. It would rank fourth among the alternatives for risk to riparian areas due to expected wind energy development.

Impacts from Management Specific to Alternative IV

ROW avoidance areas would include the same miles of perennial streams and Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, III, and IV. The risk for impacts to riparian condition are the same for these alternatives; more than would be expected for Alternatives V and VI.

ROW exclusion areas are the same as those described for Alternative I with the addition of Lands with Wilderness Characteristics. These areas encompass 125 miles of perennial streams. PFC ratings were completed on 55 miles of these streams; 19 miles are Priority 1 reaches, 2 miles are Priority 2 reaches and 33 miles are Priority 3 reaches. Alternative IV would have fewer miles of Priority 1 and 2 reaches within ROW exclusion areas then Alternative V but more than the other alternatives

There would be 60 miles of perennial streams in areas available for ROWs that are not within the ROW exclusion or ROW avoidance areas. PFC ratings were completed on 37 of these miles; 23 miles are Priority 1 and 2 reaches and would be at most risk for impacts to riparian condition due to ROW development. Alternative IV would have fewer miles of Priority 1 and 2 reaches in areas available for ROWs than the No Action Alternative and Alternatives I, II, and III, but less than would be expected for Alternatives V and VI. It would rank second in risk for impacts to riparian condition of all alternatives.

The utility ROW corridors are the same as Alternative I. The risk for impacts to riparian areas are the same as Alternative I.

Expected wind energy development areas for Alternative IV would affect the same miles of perennial streams and the same miles of Priority 1 and 2 reaches as Alternatives I and V. The impacts are the same as for all three alternatives; they pose the least risk for impacts to riparian condition of all alternatives.

Impacts from Management Specific to Alternative V

The ROW avoidance areas would encompass 295 miles of perennial streams. PFC ratings were completed on 213 miles of these streams; 131 miles are Priority 1 and 2 reaches. Alternative V, similar to Alternative VI, would have more miles of Priority 1 and 2 reaches in ROW avoidance areas than for the other alternatives. Alternative V, similar to Alternative VI, would pose the least risk for impacts to riparian condition and Priority 1 and 2 reaches of all alternatives.

ROW exclusion areas for Alternative V are the same as described for Alternative IV with the addition of Lands with Wilderness Characteristics along the Bruneau River and Jarbidge River. These areas encompass 148 miles of perennial streams, which is the most of all alternatives. PFC ratings were completed on 68 miles of these streams; 21 miles are Priority 1 reaches, 4 miles are Priority 2 reaches, and 43 miles are Priority 3 reaches. Alternative V would have the most miles of perennial streams and the most miles of Priority 1 and 2 reaches within ROW exclusion areas of all alternatives.

There would be 22 miles of perennial streams in areas available for ROWs that are not within the ROW exclusion or ROW avoidance areas. PFC ratings were completed on 11 of these miles; 8 miles are Priority 1 and 2 reaches and would be at most risk to riparian condition due to ROW development. Alternative V would have the second fewest miles of Priority 1 and 2 reaches within areas available for ROWs; one mile more than Alternative VI but less than the other alternatives. It would have the second fewest risk for impacts to riparian condition of all alternatives.

The utility ROW corridors are the same as Alternative I. The effects are the same as Alternative I.

Expected wind energy development areas for Alternative V would affect the same areas described in Alternative I except it would include a smaller area along Salmon Falls Creek below the dam. The expected wind development areas would affect the same miles of perennial streams and the same miles of Priority 1 and 2 reaches as for Alternatives I and VI, which pose the fewest risks to riparian condition in Priority 1 and 2 reaches of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The ROW avoidance areas would include 297 miles of perennial streams, which is the most of all alternatives. PFC ratings were completed on 213 miles of these streams; 131 miles are Priority 1 and 2 reaches. Alternative VI, similar to Alternative V, would have more miles of Priority 1 and 2 reaches in ROW avoidance areas than for the other alternatives. Alternative VI, similar to Alternative V, would pose the least risk for impacts to riparian condition and Priority 1 and 2 reaches of all alternatives.

ROW exclusion areas would be in the same locations and would encompass the same miles of perennial stream and Priority 1 and 2 reaches as described for Alternative I and III. Similar to Alternatives I and III, impacts to riparian conditions are not expected to occur due to the granting of ROWs within the ROW exclusion areas.

There would be 21 miles of perennial streams in areas available for ROWs that are not within the ROW exclusion or ROW avoidance areas, which is the least of all alternatives. PFC ratings were completed on 10 of these miles; 7 miles are Priority 1 and 2 reaches and would be at most risk to riparian condition due to ROW development. Alternative VI would have the fewest miles of Priority 1 and 2 reaches within areas available for ROWs of all alternatives and would have the least risk for impacts to riparian condition of all alternatives.

The utility ROW corridors would include six miles of perennial stream which is more than the No Action Alternative but less than the other alternatives. This alternative would allow ROWs for buried utilities in addition to the overhead utility ROWs for the other alternatives. The buried ROW utility corridors would encompass less than two miles of Priority 1 and 2 reaches. Alternative VI would pose fewer risks to riparian conditions and Priority 1 and 2 reaches than Alternatives I, II, III, IV, and V but less than the No Action Alternative.

Expected wind energy development areas would encompass nine miles of perennial streams which is less than the No Action Alternative and Alternative II but more than the other alternatives. Alternative VI would include one mile of Priority 1 reach, five miles of Priority 2 reaches, and one mile of Priority 3 reach in expected wind energy development areas. This alternative would have more miles of Priority 1 and 2 reaches in areas of expected wind energy development than Alternatives I, III, IV, and V but less than the No Action Alternative and Alternative II. Alternative VI would rank third in risk to riparian condition from expected wind energy development; less than for the No Action Alternative and Alternative II but more than for the other alternatives.

Impacts from Minerals Actions

The impacts from minerals exploration and development actions in Riparian Conservation Areas (RCAs) are primarily related to streambank and streambed alteration, removal of riparian vegetation, sediment introduction to streams from ground-disturbing activities such as road construction and maintenance, facilities development and operation, and general impacts to water quality and quantity. Proper functioning condition (PFC) rated Priority 1 and 2 reaches are at an increased risk of further decline and are less likely to improve when in areas available to leasable, salable, or locatable mineral development than for areas that are closed to or withdrawn from such uses. PFC Priority 3 reaches are more resilient to impacts associated with these uses; these areas are still at risk for decline due to minerals exploration or development, but at less risk than would be expected if they were in a reduced condition prior to exploration or development.

The following indicator was used to analyze the impacts of mineral actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches in areas open to leasable, salable, and locatable mineral exploration and development.

Some aspects of oil and gas or geothermal exploration and development, such as blasting, consumptive and non-consumptive use of surface or groundwater, disposal of waste water, and general ground disturbance in RCAs, would reduce PFC ratings for riparian areas and wetlands. Directional drilling to access geothermal or oil and gas resources may indirectly impact riparian areas and wetlands. No surface occupancy restrictions would prevent direct impacts to riparian areas. Indirect impacts would occur where activities associated with mineral exploration or development occurs in RCAs at any time of the year. Table 4-106 and Table 4-107 describe oil and gas leasing and geothermal leasing allocations, respectively, for priority reaches.

Table 4-106. Leasable Mineral Allocations for Priority Reaches in Expected Oil and Gas Areas by Alternative (Miles)

Priority Rating	Alternative					
	I	II	III	IV	V	VI
Available						
Priority 1	16	16	16	11	11	16
Priority 2	8	16	12	10	6	12
Priority 3	13	24	13	10	10	13
Total	**37**	**56**	**41**	**31**	**27**	**41**
Closed						
Priority 1	0	0	0	5	5	0
Priority 2	8	0	4	7	10	4
Priority 3	12	0	11	14	15	11
Total	**20**	**0**	**15**	**26**	**30**	**15**

[A] The No Action Alternative identifies the majority of the planning area as available for mineral leasing, but does not identify specific boundaries.
[B] Includes areas open with surface occupancy, seasonal, and/or controlled surface use restrictions as well as areas open for leasing without these restrictions.

Table 4-107. Leasable Mineral Allocations for Priority Reaches by Geothermal Potential in Expected Geothermal Areas by Alternative (Miles)

Priority Rating	Alternative [A]						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Medium Potential for Geothermal Development							
Available [C]							
Priority 1	1	1	1	1	1	1	1
Priority 2	3	10	7	7	7	3	7
Priority 3	2	14	3	3	3	2	3
Total	**6**	**25**	**11**	**11**	**11**	**6**	**11**
Closed							
Priority 1	0	0	0	0	0	0	0
Priority 2	6	0	3	3	3	6	2
Priority 3	12	0	11	11	11	12	9
Total	**18**	**0**	**14**	**14**	**14**	**18**	**11**
Low Potential for Geothermal Development							
Available [C]							
Priority 1	46	60	47	20	42	42	46
Priority 2	51	54	52	47	49	49	52
Priority 3	35	45	39	29	29	32	35
Total	**132**	**158**	**138**	**96**	**120**	**123**	**133**
Closed							
Priority 1	29	15	28	33	33	33	29
Priority 2	3	0	2	8	6	6	2
Priority 3	38	28	35	44	44	41	38
Total	**70**	**43**	**65**	**85**	**83**	**80**	**69**

[A] The No Action Alternative identifies the majority of the planning area as available for mineral leasing, but does not identify specific boundaries.
[B] No riparian areas were rated as High Potential.
[C] Includes areas open with surface occupancy, seasonal, and/or controlled surface use restrictions as well as areas open for leasing without these restrictions.

Existing salable mineral developments in the planning area are located outside RCAs. However, if future salable mineral developments were to occur in RCAs, impacts to PFC rating would result. The risk of a decrease in PFC rating would be greater for Priority 1 and 2 reaches available to salable mineral

development than for Priority 3 reaches. Table 4-108 displays allocations for salable mineral development for priority reaches.

Table 4-108. Salable Mineral Allocations for Priority Reaches by Alternative (Miles)

Priority Rating	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Available							
Priority 1	47	60	47	42	42	42	47
Priority 2	57	62	58	53	55	52	58
Priority 3	37	52	41	31	31	34	37
Total	**141**	**174**	**146**	**126**	**128**	**128**	**142**
Closed							
Priority 1	29	16	29	34	34	34	29
Priority 2	6	1	4	10	8	11	4
Priority 3	43	33	43	53	53	50	47
Total	**78**	**50**	**76**	**97**	**95**	**95**	**80**

[A] The No Action Alternative identifies acres available to salable mineral development, but not specific locations.

Most locatable mineral development in the planning area has historically occurred in RCAs (e.g., jasper and gold claims); locatable mineral development in RCAs can result in disturbances to the streambed, streambank, streamflow, and streamside vegetation, which can reduce PFC ratings. Water quality can be affected as a result of chemicals used in the mineral extraction process. Recreational panning and placer mining for gold can locally impair riparian and wetlands function by removing riparian vegetation or disturbing the streambed (Nelson et al., 1991). In general, locatable minerals exploration and development can result in short- and long-term decreases in PFC ratings where activities occur within riparian areas and wetlands. Impacts to riparian conditions are not expected to occur within areas withdrawn statute, such as the Bruneau-Jarbidge Rivers Wilderness, because these areas are not available for locatable mineral exploration or development. Table 4-109 displays priority reaches within areas recommended for withdrawal and withdrawn by statue from mineral entry by alternative.

Table 4-109. Priority Reaches in Areas Withdrawn or Recommended for Withdrawal from Locatable Mineral Development by Alternative (Miles)

Priority Rating	Alternative					
	I	II	III	IV	V	VI
Recommended for Withdrawal						
Priority 1 and 2	21	17	17	19	20	0
Priority 3	20	15	15	22	16	0
Total	**41**	**32**	**32**	**41**	**36**	**0**
Withdrawn by Statute						
Priority 1	15	15	15	15	15	15
Priority 3	28	28	28	28	28	28
Total	**43**	**43**	**43**	**43**	**43**	**43**

Impacts from Management Specific to the No Action Alternative

The No Action Alternative allows mineral leasing in riparian areas, but with a no surface occupancy stipulation within 500 feet of the riparian area; there are currently no active mineral leases within the planning area. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. None of the mineral material sources that have been developed under the No Action Alternative were located in areas that impacted riparian areas or wetlands. The allocation for locatable minerals recommends the Bruneau-Jarbidge and Sand Point Areas of Critical Environmental Concern; designated wilderness; and the Bruneau, Jarbidge, and Salmon Falls Creek Canyons to be withdrawn from mineral entry. This withdrawal would reduce the potential for impacts from locatable mineral development in these riparian areas.

Ground disturbance associated with leasable, salable, and locatable minerals exploration and development within riparian areas would reduce riparian vegetation and destabilize streambanks which would also reduce PFC ratings. However, according to the Reasonably Foreseeable Development Scenario (RFDS) for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. Similarly, according to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur in the planning area as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing. Salable mineral development is expected to occur on approximately 0.2% of the area available for salable mineral development. Demand for locatable minerals in the planning area, which has historically been low, is not expected to change from present levels.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All alternatives would have the Bruneau-Jarbidge Rivers Wilderness and designated Wild and Scenic River (WSR) corridors withdrawn from locatable mineral development by statute. For all alternatives, this would result in 84 miles of perennial stream and 43 miles of Priority 1 and 2 reaches being unavailable for locatable mineral development. PFC ratings would be maintained or improved under wilderness and designated WSR management.

Impacts from Management Common to All Action Alternatives

Management actions for leasable, salable, and locatable mineral developments would be implemented consistent with the goals, objectives and management actions for riparian areas and wetlands, which would reduce the risk for impacts to riparian areas and wetlands from leasable, salable and locatable minerals actions. Use restrictions are expected to reduce the potential for a reduction in PFC ratings due to surface-disturbing activities or occupancy in RCAs. Closing RCAs to mineral development during special status fish and aquatic invertebrate species spawning periods would reduce impacts to streambanks and riparian vegetation in the spring and fall, but activities in RCAs at other times of the year would still result in impacts to PFC ratings.

Impacts from Management Specific to Alternative I

Within expected oil and gas areas, Alternative I would have 58 miles of perennial streams in areas available and 34 miles in areas closed to oil and gas leasing. Expected oil and gas areas available for leasing contain 16 miles of Priority 1 reaches, 8 miles of Priority 2 reaches, and 13 miles of Priority 3 reaches, while expected oil and gas areas closed to leasing contain no Priority 1 reaches, 8 miles of Priority 2 reaches, and 12 miles of Priority 3 reaches. Priority 1 and 2 reaches in potential oil and gas areas available for leasing are at more risk from the effects of oil and gas development than Priority 3 reaches because of their reduced riparian condition. However, the actual impact is expected to be low, as only 90 acres of surface disturbance from oil and gas exploration and leasing activities are expected, based on the oil and gas potential of the planning area (Appendix K). This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. In addition, even if all 90 acres were located in RCAs, the controlled surface use restriction for RCAs would require surface use to be consistent with the goals, objectives and management actions for riparian areas and wetlands, which is to manage riparian areas and wetlands for PFC. Alternative I would have the third fewest miles of Priority 1 and 2 reaches in expected oil and gas areas available for leasing of the action alternatives; more than Alternatives IV and V but less than the other alternatives.

Areas with medium or low expected geothermal development encompass 133 miles of perennial streams in areas available for leasing and 184 miles of perennial streams in areas closed to leasing. Areas available for leasing contain 47 miles of Priority 1 reaches, 54 miles of Priority 2 reaches, and 37 miles of Priority 3 reaches. Due to their reduced condition, Priority 1 and 2 reaches are more at risk for a reduction in PFC ratings when in open areas than Priority 3 reaches. The types of impacts of geothermal exploration and development in RCAs are similar to those described for oil and gas, except 185 to 230 acres of surface disturbance are expected for geothermal activities based on geothermal resource potential (Appendix L). This is less than 0.1% of the potential geothermal areas that would be available

for geothermal leasing. Alternative I would have fewer miles of Priority 1 and 2 reaches available for geothermal leasing in areas with medium and low potential than the No Action Alternative and Alternatives II, III, and VI. It would rank fourth in risk for impacts to riparian conditions due to expected geothermal development.

Alternative I would have 141 miles of perennial streams in areas available for and 180 miles in areas closed to salable mineral development. Areas available for salable mineral development contain 47 miles of Priority 1 reaches, 57 miles of Priority 2 reaches, and 37 miles of Priority 3 reaches. Salable mineral development under this management would have minor, if any, impacts to riparian areas and wetlands. Alternative I would have fewer miles of Priority 1 and 2 reaches in areas available for salable minerals than Alternatives II, III, and VI but more than Alternatives IV and V. It would rank third in risk for impacts to riparian areas of all alternatives.

There would be 100 miles of perennial streams in areas recommended for withdrawal from locatable mineral development. Areas recommended for withdrawal include 21 miles of Priority 1 and 2 reaches and 20 miles of Priority 3 reaches. Alternative I would have the most miles of Priority 1 and 2 reaches recommended for withdrawal of the alternatives; similar to but one mile more than Alternative V. Demand for locatable minerals in the planning area is not expected to change from present levels, which is low.

Impacts from Management Specific to Alternative II

Within expected oil and gas areas, Alternative II would have 91 miles of perennial streams in areas open and 1 mile in areas closed to oil and gas leasing. Expected oil and gas areas available for leasing contain 16 miles of Priority 1 reaches, 16 miles of Priority 2 reaches, and 24 miles of Priority 3 reaches, while expected oil and gas areas closed to leasing contain no Priority 1 and 2 reaches. The types of impacts of oil and gas exploration and development are the same as described for Alternative I, except there would be more miles of perennial streams and Priority 1 and 2 reaches in areas open for oil and gas development. Alternative II would have the most miles of Priority 1 and 2 reaches available for leasing of all alternatives and would pose the most risk for impacts to Priority 1 and 2 reaches of all alternatives.

Areas with medium or low expected geothermal development encompass 214 miles of perennial streams in areas in areas available for leasing and 103 miles of perennial streams in areas closed to leasing. Areas available for leasing contain 61 miles of Priority 1 reaches, 64 miles of Priority 2 reaches, and 59 miles of Priority 3 reaches. The types of impacts of geothermal exploration and development are the same as described for Alternative I, but more miles of Priority 1 and 2 reaches are in areas of expected geothermal development. Alternative II would have the most miles of Priority 1 and 2 reaches available for geothermal leasing of all action alternatives and therefore would pose the most risk form impacts to riparian condition of all alternatives.

Alternative II would have 203 miles of perennial streams in areas open and 114 miles in areas closed to salable mineral development. Areas available for salable mineral development contain 60 miles of Priority 1 reaches, 62 miles of Priority 2 reaches, and 52 miles of Priority 3 reaches. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 3,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Salable mineral development under this management direction would have minor, if any, impacts to riparian areas or wetlands. This alternative would have the most Priority 1 and 2 reaches in areas available for salable mineral development and would pose the most risk for impacts to riparian condition of the action alternatives.

There would be 87 miles of perennial streams in areas recommended for withdrawal from locatable mineral development. The areas recommended for withdrawal include 17 miles of Priority 1 and 2 reaches and 15 miles of Priority 3 reaches. Alternative II, similar to Alternative III, would have the second fewest miles of Priority 1 and 2 reaches recommended for withdrawal of all action alternatives. It would pose the second greatest risk for impacts to Priority 1 and 2 reaches; less than Alternative VI but more than the other alternatives.

Impacts from Management Specific to Alternative III

Within expected oil and gas areas, Alternative III would have 64 miles of perennial streams in areas open and 28 miles in areas closed to oil and gas leasing. Expected oil and gas areas available for leasing contain 16 miles of Priority 1 reaches, 12 miles of Priority 2 reaches, and 13 miles of Priority 3 reaches, while expected oil and gas areas closed to leasing contain no Priority 1 reaches, 4 miles of Priority 2 reaches, and 11 miles of Priority 3 reaches. Alternative III, similar to Alternative VI, would include more miles of priority streams in expected oil and gas areas available for leasing than Alternatives I, IV, and V but less than Alternative II. The effects from this alternative are the same as described for Alternative I, except slightly more miles of Priority 1 and 2 reaches would be in open areas for oil and gas leasing.

Areas with medium or low expected geothermal development encompass 146 miles of perennial streams in areas in areas available for leasing and 171 miles of perennial streams in areas closed to leasing. Areas available for leasing contain 48 miles of Priority 1 reaches, 59 miles of Priority 2 reaches, and 42 miles of Priority 3 reaches. The types of impacts of geothermal exploration and development are the same as for Alternative I, but more miles of Priority 1 and 2 reaches are in areas of expected geothermal development. Alternative III would have fewer miles of Priority 1 and 2 reaches available for geothermal leasing than Alternative II, which has the most miles of all action alternatives. It would rank second in risk for impacts to riparian condition of all alternatives.

Alternative III would have 144 miles of perennial streams in areas open and 173 miles in areas closed to salable mineral development. Areas available for salable mineral development contain 47 miles of Priority 1 reaches, 58 miles of Priority 2 reaches, and 41 miles of Priority 3 reaches. This alternative, similar to Alternative VI, would have the second most Priority 1 and 2 miles available for salable mineral development of all alternatives; less than Alternative II but more than the other alternatives.

Alternative III would have the same miles of perennial stream and the same miles of Priority 1 and 2 reaches recommended for withdrawal from locatable minerals as Alternative II; the risk for impact are the same as Alternative II.

Impacts from Management Specific to Alternative IV

Within expected oil and gas areas, Alternative IV would have 54 miles of perennial streams in areas open and 38 miles in areas closed to oil and gas leasing. Expected oil and gas areas available for leasing contain 11 miles of Priority 1 reaches, 10 miles of Priority 2 reaches, and 10 miles of Priority 3 reaches, while expected oil and gas areas closed to leasing contain 5 miles of Priority 1 reaches, 7 miles of Priority 2 reaches, and 14 miles of Priority 3 reaches. The types of impacts of oil and gas exploration and development are the same as described for Alternative I, except fewer miles of Priority 1 and 2 reaches would be in areas of expected oil and gas development. Alternative IV would have the second fewest miles of Priority 1 and 2 reaches available for leasing; more than Alternative V but less than the other action alternatives. Alternative IV would have the second lowest risk for impacts to riparian areas of all alternatives.

In areas with medium or low potential for geothermal development, there is a slight variation in the open and closed acres for Alternatives IV-A and IV-B. Alternative IV-A has 124 miles of perennial streams in areas open and 193 miles in areas closed to leasing, while Alternative IV-B has 126 miles of perennial stream in areas open and 191 miles in areas closed to leasing. Areas available for leasing in Alternative IV-A include 21 miles of Priority 1 reaches and 54 miles of Priority 2 reach; areas available for geothermal leasing for Alternative IV-B include 43 miles of Priority 1 reach and 56 miles of Priority 2 reaches. Both alternatives include 32 miles of Priority 3 reaches. The types of impacts of geothermal exploration and development are the same as described for Alternative I, except fewer miles of Priority 1 and 2 reaches are in areas of expected geothermal development. Alternative IV-A would have the fewest miles of Priority 1 and 2 reaches available for geothermal leasing of all alternatives.

In Alternative IV-A, areas available for salable mineral development contain 123 miles of perennial stream; 42 miles of Priority 1 reaches, 53 miles of Priority 2 reach, and 31 miles of Priority 3 reach. Alternative IV-B would have 125 miles of perennial stream available for salable mineral development; 42 miles of Priority 1 reach, 55 miles of Priority 2 reach, and 31 miles of Priority 3 reach. The difference

between Alternatives IV-A and IV-B varies by two miles along Clover Creek. Alternative IV would have slightly more miles of Priority 1 and 2 reaches available for salable minerals than Alternative V, which is the least of all alternatives. It would pose the second fewest risks for impacts to riparian area of all alternatives.

Alternative IV would have 97 miles of perennial streams in areas recommended for withdrawal from locatable mineral development. Areas recommended to be withdrawn include 19 miles of Priority 1 and 2 reaches and 22 miles of Priority 3 reaches. Alternative IV would have more miles of Priority 1 and 2 reaches in areas recommended withdrawn from locatable mineral development than Alternatives II, III, and VI but less than Alternatives I and V. Alternative IV would rank third in risk for impacts to riparian conditions due to locatable mineral development.

Impacts from Management Specific to Alternative V

Within expected oil and gas areas, Alternative V would have 43 miles of perennial streams in areas open and 49 miles in areas closed to oil and gas leasing. Expected oil and gas areas available for leasing contain 11 miles of Priority 1 reaches, 6 miles of Priority 2 reaches, and 10 miles of Priority 3 reaches, while expected oil and gas areas closed to leasing contain 5 miles of Priority 1 reaches, 10 miles of Priority 2 reaches, and 15 miles of Priority 3 reaches. The types of impacts of oil and gas exploration and development are the same as described for Alternative I, except fewer miles of Priority 1 and 2 reaches would be in expected oil and gas development areas. Alternative V would have the fewest miles of Priority 1 and 2 reaches available for leasing in potential oil and gas areas of all alternatives and would have the least risk for impacts to riparian areas of all alternatives.

Areas with medium or low expected geothermal development would encompass 123 miles of perennial streams in areas available for geothermal leasing and 194 miles in areas closed to geothermal leasing. The miles of priority reaches in areas open for leasing for Alternative V include 43 miles of Priority 1 reaches, 52 miles of Priority 2 reaches, and 34 miles of Priority 3 reaches. The types of impacts of geothermal exploration and development for Alternative V are the same as described for Alternative I, but fewer miles of Priority 1 and 2 reaches are in areas of expected geothermal development. Alternative V would have the second fewest miles of Priority 1 and 2 reaches available for geothermal leasing in areas with medium and low potential of all alternatives; more than Alternative IV-A but less than the other alternatives.

Alternative V would include 122 miles of perennial streams in areas open and 195 miles in areas closed to salable mineral development. There are 42 miles of Priority 1 reaches, 52 miles of Priority 2 reaches, and 34 miles of Priority 3 reaches in areas available for salable mineral development. This alternative would have the fewest miles of Priority 1 and 2 reaches available for salable mineral development of any alternative, one mile less than Alternative IV-A. It would pose the least risk for impacts to riparian condition from salable minerals development of all alternatives.

Alternative V would have 93 miles of perennial streams in areas recommended for withdrawal from locatable mineral development. Areas recommended to be withdrawn include 20 miles of Priority 1 and 2 reaches and 16 miles of Priority 3 reaches. Alternative V would have the second fewest miles of Priority 1 and 2 reaches recommended for withdrawn from locatable mineral development; less than Alternative I but more than the other alternatives. It would pose the second fewest risk for impacts to riparian condition of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Within expected oil and gas areas, Alternative VI would have 28 miles of perennial streams in areas open and 64 miles in areas closed to oil and gas leasing. Expected oil and gas areas available for leasing contain 16 miles of Priority 1 reaches, 12 miles of Priority 2 reaches, and 13 miles of Priority 3 reaches, while expected oil and gas areas closed to leasing contain no miles of Priority 1 reaches, 4 miles of Priority 2 reaches, and 11 miles of Priority 3 reaches. The types of impacts of oil and gas exploration and development are the same as described for Alternative I, except there would be more miles of Priority 1 and 2 reaches in areas of expected oil and gas development. Alternative VI, along with Alternative III,

would have the second highest miles of Priority 1 and 2 reaches available for oil and gas leasing; it would have the second highest risk for impacts to riparian areas within expected oil and gas development areas.

In areas with medium or low expected geothermal development, Alternative VI would have 139 miles of perennial streams in areas available for geothermal leasing and 178 miles in areas closed to geothermal leasing. The miles of priority reaches in areas open for leasing include 47 miles of Priority 1 reaches, 59 miles of Priority 2 reaches, and 38 miles of Priority 3 reaches. The impacts for Alternative VI are the same as described for Alternative I except more miles of Priority 1 and 2 reaches are in areas of expected geothermal development. Alternative VI would have fewer miles of Priority 1 and 2 reaches available for geothermal leasing in areas with medium and low potential than Alternatives II and III but more than Alternatives I, IV, and V. It would rank third in risk to riparian conditions due to geothermal development.

Alternative VI would include 138 miles of perennial streams in areas open and 180 miles in areas closed to salable mineral development. There are 47 miles of Priority 1 reaches, 58 miles of Priority 2 reaches, and 37 miles of Priority 3 reaches in areas available for salable mineral development. Alternative VI would have the same miles of Priority 1 and 2 reaches in areas available for salable mineral development as Alternative III; the impacts are the same as Alternative III. Alternative VI, similar to Alternative III, would pose fewer risks for impacts to riparian conditions due to salable minerals development than Alternative II but more than other alternatives.

Alternative VI does not identify areas as recommended for withdrawal from locatable mineral development. Therefore, it would have the most miles of Priority 1 and 2 reaches in areas available for locatable mineral development and would pose the most risk for impacts to Priority 1 and 2 reaches of all alternatives.

Impacts from Areas of Critical Environmental Concern Actions

The management actions for Areas of Critical Environmental Concern (ACECs) are designed to maintain or improve relevant and important values by modifying or eliminating activities that are impairing the identified values. ACEC management actions would promote healthy riparian vegetation would improve proper functioning condition (PFC) ratings over the life of the plan. Management actions for the ACECs along the Snake River would have limited effect on PFC ratings due to fluctuating water levels with the operation of hydroelectric dams throughout the Snake River. For other ACECs, ACEC management is expected to improve PFC ratings and facilitate Priority 1 and 2 reaches moving toward or attaining riparian objectives. Several ACECs contain Riparian Conservation Areas encompassed in Wilderness or Wild and Scenic River (WSR) designations; these designations would improve and maintain fully functioning riparian and instream conditions under this management direction.

The following indicator was used to analyze the impacts of Areas of Critical Environmental Concern actions on riparian areas and wetlands:

- Riparian condition of Priority 1 and 2 reaches within ACEC designations.

ACEC management is expected to improve PFC ratings, which would achieve riparian areas and wetlands objectives. Table 4-110 contains the miles of priority reaches in ACECs by alternative.

Table 4-110. Priority Reaches in Areas of Critical Environmental Concern by Alternative (Miles)

Priority Rating [A]	Alternative [B]							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Bruneau-Jarbidge ACEC								
Priority 1 and 2	22	22	NA	6	30		NA	NA
Priority 3	37	37	NA	28	41		NA	NA
Total	**59**	**59**	**NA**	**34**	**71**		**NA**	**NA**

Priority Rating [A]	Alternative [B]							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Inside Desert ACEC								
Priority 1 and 2	NA	NA	NA	NA	2	0	NA	NA
Priority 3	NA	NA	NA	NA	0	0	NA	NA
Total	**NA**	**NA**	**NA**	**NA**	**2**	**0**	**NA**	**NA**
Jarbidge Foothills ACEC								
Priority 1 and 2	NA	NA	NA	NA	46	13	NA	NA
Priority 3	NA	NA	NA	NA	24	7	NA	NA
Total	**NA**	**NA**	**NA**	**NA**	**70**	**20**	**NA**	**NA**
Middle Snake ACEC								
Priority 1 and 2	NA	5	NA	NA	NA	NA	5	NA
Priority 3	NA	5	NA	NA	NA	NA	5	NA
Total	**NA**	**10**	**NA**	**NA**	**NA**	**NA**	**10**	**NA**
Sagebrush Sea ACEC								
Priority 1 and 2	NA	NA	NA	NA	NA	NA	129	NA
Priority 3	NA	NA	NA	NA	NA	NA	73	NA
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**202**	**NA**
Salmon Falls Creek ACEC								
Priority 1 and 2	< 1	< 1	NA	< 1	NA	NA	NA	< 1
Priority 3	0	0	NA	0	NA	NA	NA	0
Total	**< 1**	**< 1**	**NA**	**< 1**	**NA**	**NA**	**NA**	**< 1**
Sand Point ACEC								
Priority 1 and 2	0	0	NA	0	0		0	0
Priority 3	1	2	NA	2	2		2	2
Total	**1**	**2**	**NA**	**2**	**2**		**2**	**2**
Upper Bruneau Canyon ACEC								
Priority 1 and 2	NA	NA	NA	NA	NA	NA	NA	1
Priority 3	NA	NA	NA	NA	NA	NA	NA	4
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**5**
Total under ACEC Management	**60**	**71**	**0**	**36**	**145**	**93**	**214**	**7**

[A] There is no PFC data available for the Lower Bruneau Canyon ACEC.
[B] NA indicates the ACEC would not be designated in that alternative.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Riparian and instream conditions would be maintained or improved within areas designated as Wilderness Study Area or designated, eligible or suitable WSR management.

Impacts from Management Specific to the No Action Alternative

The Bruneau-Jarbidge, Salmon Falls Creek, and Sand Point ACECs include approximately 142 miles of perennial streams. The Bruneau-Jarbidge ACEC includes 109 miles of perennial streams, while the Salmon Falls Creek ACEC includes approximately 31 miles. The Sand Point ACEC includes 1 mile along the Snake River. For these streams, there are 60 miles of PFC assessments; 22 miles are Priority 1 and 2 reaches. The result of ACEC management for the No Action Alternative is riparian areas are in good condition relative to impacts due to other actions not within BLM discretion (e. g., hydroelectric operation, dams). Two of the three ACECs receive a limited amount of human use due to the steep canyon walls that limit access. The impacts to riparian and instream conditions are primarily related to recreational uses and an increased occurrence of invasive plants. No Action Alternative is expected to maintain or improve riparian condition within the designated ACECs. ACEC management for the No Action Alternative is expected to maintain PFC ratings over the life of the plan. This alternative would rank fourth in miles of Priority 1 and 2 reaches within ACEC management. It would have fewer risks for impacts to riparian and instream conditions than Alternatives II, III, and VI but more than the other alternatives.

Impacts from Management Specific to Alternative I

This alternative would designate five ACECs which encompass 157 miles of perennial stream. For these streams, there are 71 miles of PFC assessments; 26 miles are Priority 1 and 2 reaches. Actions implemented to improve riparian and aquatic resource values in these ACECs would use the restoration priorities identified in the Aquatic and Riparian Management Strategy (ARMS; Appendix D, Tables D-3, D-4, and D-5). This would improve PFC ratings and promote attaining or moving toward riparian areas and wetlands objectives. Alternative I would rank third in the miles of Priority 1 and 2 reaches within ACEC management. Except for Alternative II which would not have ACECs, Alternative I would have fewer risks for impacts to riparian and instream condition than Alternatives IV and V, but more than the other alternatives.

Impacts from Management Specific to Alternative II

No ACECs would be designated in Alternative II. Not designating ACECs would likely result in a slower rate of achieving riparian areas and wetlands objectives than if ACECs were designated to improve relevant and important values. However, the management direction under this alternative for riparian areas is expected to reduce the potential for impacts to PFC ratings, and improve these ratings over time. The stream reaches most at risk for impacts to PFC ratings would be those reaches identified as Priority 1 and 2 reaches (Appendix D, Tables D-3, D-4, and D-5). Compared to the other alternatives, Alternative II would pose the most risk for impacts to riparian and instream conditions relative to ACEC management.

Impacts from Management Specific to Alternative III

Alternative III would designate three ACECs which would encompass 84 miles of perennial streams. For these streams, there are 36 miles of PFC assessments; 6 miles are Priority 1 and 2 reaches. Actions implemented to improve riparian and aquatic resource values in these ACECs would use the restoration priorities identified in the ARMS (Appendix D, Tables D-3, D-4, and D-5). Actions implemented to improve resource values in the ACECs would improve PFC ratings and promote attaining or moving toward riparian areas and wetlands objectives. Alternative III would rank fifth in the miles of Priority 1 and 2 reaches within ACEC management. It would have fewer risks for impacts to riparian and instream condition than Alternatives II and VI, but more than the other alternatives.

Impacts from Management Specific to Alternative IV

Alternative IV would include five ACECs. Alternative IV-A would include 196 miles of perennial streams, while Alternative IV-B would include 162 miles of perennial streams. Alternative IV-A would encompass 145 miles of PFC rated streams; 78 miles are Priority 1 and 2 reaches. Alternative IV-B would encompass 93 miles of PFC rated streams; 42 miles are Priority 1 and 2 reaches. Actions implemented to improve resource values within the ACECs would comply with the riparian areas and wetlands management to improve riparian and instream conditions according to the priorities in the ARMS (Appendix D, Tables D-3, D-4, and D-5). This would improve PFC ratings and promote attaining or moving toward riparian areas and wetlands objectives. Alternative IV would rank second in the miles of Priority 1 and 2 reaches within ACEC management. It would have more risk for impacts to riparian and instream condition than Alternative V but less than the other alternatives.

Impacts from Management Specific to Alternative V

Alternative V would include four ACECs which would encompass 276 miles of perennial streams; the most of all alternatives. It would encompass 214 miles of PFC rated stream; with 133 miles of Priority 1 and 2 reaches which is the most of all alternatives. The Sagebrush Sea ACEC would encompass the southern two-thirds of the planning area and would include the Inside Desert, Jarbidge Foothills, and Salmon Falls Creek ACECs and most of the Bruneau-Jarbidge ACEC. Alternative V would have the most miles of Priority 1 and 2 reaches within ACEC management of all alternatives. It would pose the least risk for impacts to riparian and instream condition and is the most likely to achieve riparian areas and wetlands objectives relative to ACEC management of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate four ACECs which would encompass 49 miles of perennial streams. It would encompass seven miles of PFC rated stream; with one mile of Priority 1 and 2 reaches. Except for Alternative II, Alternative VI would have the fewest miles of perennial stream and miles of Priority 1 and 2

reaches under ACEC management of all alternatives. However, the management direction under this alternative for riparian areas is expected to reduce the potential for impacts to PFC ratings, and improve these ratings over time. The stream reaches most at risk for impacts to PFC ratings would be those reaches identified as Priority 1 and 2 reaches (Appendix D, Tables D-3, D-4, and D-5). Alternative VI would pose the second most risk for impacts to riparian and instream conditions relative to ACEC management.

Summary of Direct and Indirect Impacts

The impact analysis for riparian areas and wetlands focused on resource uses and activities that posed the greatest risk for reducing riparian condition as represented by the proper functioning condition (PFC) ratings. Allocations making areas available for these uses and activities include the following: wildland fire critical and conditional suppression areas, areas open and closed to livestock grazing, recreation within a Special Recreation Management Area (SRMA), travel designations (areas closed, limited and open to cross-country motorized vehicle use), areas available for rights-of-way (ROWs) and in expected wind energy development areas, areas available for mineral development and exploration, and areas affected by management of Areas of Critical Environmental Concern (ACECs). The more miles of Priority 1 and 2 reaches in these areas, the greater the risk for a reduction in riparian condition. The impacts from management actions are displayed in Table 4-111, as predicted to improve or maintain riparian conditions for the 225 miles of PFC rated streams.

Table 4-111. Summary of Impacts to Riparian Restoration (Priority 1 and 2) and Maintenance (Priority 3) Reaches by Alternative (Miles)

Actions	Alternative							
	No Action [A]	I	II	III	IV		V	VI
					IV-A	IV-B		
Wildland Fire Ecology and Management								
Improve	139	68	34	57	95	74	138	58
Maintain	85	58	23	53	77	64	84	59
Livestock Grazing								
Improve	79	107	91	91	106	105	146	102
Maintain	145	116	132	132	117	118	77	121
Recreation								
Improve	NA	112	9	10	40		7	112
Maintain	NA	111	214	213	183		216	111
Transportation and Travel								
Improve	43	56	43	43	53		66	43
Maintain	123	168	181	181	171		158	181
Land Use Authorizations								
ROWs [B]								
Improve	43	45	43	45	55		68	45
Maintain	175	175	175	175	175		213	213
Expected Wind Development Areas								
Improve	198	221	186	218	221		221	216
Maintain	25	2	37	5	2		2	7
Expected Oil and Gas Leasing Areas								
Improve	NA	20	0	15	26		30	15
Maintain	NA	37	56	41	31		27	41
Expected Geothermal Leasing Areas								
Improve	NA	88	43	79	99	97	98	80
Maintain	NA	138	183	149	107	131	129	144
Salable Minerals								
Improve	NA	78	50	76	97	95	95	80
Maintain	NA	141	174	146	126	128	128	142

Actions	Alternative							
	No Action [A]	I	II	III	IV		V	VI
					IV-A	IV-B		
Locatable Minerals								
Improve	NA	43	43	43	43		43	43
Maintain	NA	180	180	180	180		180	180
Areas of Critical Environmental Concern								
Improve	60	71	0	36	145	93	214	7
Maintain	163	152	223	187	78	130	9	216

Numbers may vary slightly due to rounding.
[A] NA is used under the No Action Alternative when allocation data are not spatially depicted; therefore, the miles of priority reaches cannot be determined.
[B] ROW avoidance and ROW exclusion areas may overlap for the alternatives.

The riparian areas and wetlands objectives, as supported by the restoration priorities in the Aquatic and Riparian Management Strategy (Appendix D; Tables D-3, D-4, and D-5) would apply to all action alternatives and are expected to reduce impacts to riparian areas, wetlands, and instream conditions. Although the rate of improvement in PFC ratings is dependent on the riparian objectives for each of the alternatives, all alternatives are expected to result in some level of improvement in riparian condition over the life of the plan.

Impacts from the No Action Alternative

Currently, 140 miles of riparian areas are in a reduced condition. This alternative is expected to maintain this current condition. The entire planning area would be managed for full suppression for wildland fires. This alternative has the most miles of Priority 1 and 2 reaches available for from livestock grazing and therefore at risk for impacts due to livestock grazing. No SRMAs would be established to reduce recreation impacts to PFC ratings from current and future recreation use. The planning area would continue to be open to cross-country travel resulting in the greatest expected increase in route density and greatest potential for a decline in PFC ratings due to travel of all alternatives. The majority of the planning area would be available for land use authorizations and minerals exploration and development. The No Action Alternative would pose the most risk for impacts to PFC ratings of all alternatives. The No Action Alternative is expected to result in the fewest miles of riparian areas attaining PFC over the life of the plan of all alternatives.

Overall, the No Action Alternative would result in minor localized short-term impacts to riparian and wetland conditions, but is expected to maintain the current condition and trends of riparian areas and wetlands in the long term.

Impacts from Alternative I

Alternative I would maintain 85 miles of stream at PFC, achieve 60 miles of PFC, and have 80 miles of stream moving toward PFC over the life of the plan. Alternative I would rank fourth for the potential to facilitate the attainment of riparian objectives when all actions for resource uses are considered for their impacts to riparian areas.

Alternative I would have fewer miles of Priority 1 and 2 reaches at risk due to their inclusion in critical suppression areas for wildland fire than Alternatives IV and V but more than the other alternatives. This alternative has more miles of Priority 1 and 2 reaches available to livestock grazing than Alternative V, the same as Alternative IV, but less than the other alternatives. Alternative I would have the greatest likelihood to reduce recreation-related impacts to Priority 1 and 2 reaches due to SRMA management; similar to Alternative VI. Alternative I would have more miles of Priority 1 and 2 reaches in areas with travel limited designations than the No Action Alternative and Alternatives IV and V, but fewer miles than Alternatives II, III, and VI. The miles of Priority 1 and 2 reaches in ROW avoidance areas are the same for the No Action Alternative and Alternatives I through IV. The miles of Priority 1 and 2 reaches in ROW avoidance areas are the same for the No Action Alternative and Alternatives I through IV. Alternative I would have the same miles of Priority 1 and 2 reaches in areas of expected wind energy development areas as Alternatives IV and V, which is less than the other alternatives. Alternative I would have the third

fewest miles of Priority 1 and 2 reaches in expected oil and gas areas available for leasing of the action alternatives; more than Alternatives IV and V but less than the other alternatives. Alternative I would have fewer miles of Priority 1 and 2 reaches available for geothermal leasing in areas with medium and low potential than the No Action Alternative and Alternatives II, III, and VI. Alternative I would have fewer miles of Priority 1 and 2 reaches in areas available for salable minerals than Alternatives II, III, and VI but more than Alternatives IV and V. It would rank third in risk for impacts to riparian areas of all alternatives. Alternative I would have the most miles of Priority 1 and 2 reaches recommended for withdrawal of the alternatives; similar to but one mile more than Alternative V. Alternative I would rank third in the miles of Priority 1 and 2 reaches within ACEC management.

Overall, Alternative I would result in minor to moderate localized short-term adverse impacts to riparian and wetland conditions, but is expected to result in maintaining or minor but extensive improvement in riparian and wetlands conditions in the long term.

Impacts from Alternative II

Alternative II would maintain 85 miles of stream at PFC and move 140 miles of stream toward PFC over the life of the plan. This amount and rate of riparian improvement is slower than all other action alternatives. Alternative II would result in the fewest miles of riparian area rated as PFC over the life of the plan of all alternatives except the No Action Alternative.

Alternative II has the fewest miles of Priority 1 and 2 reaches in critical suppression areas for wildland fire of all alternatives. It would pose the greatest risk for impacts to riparian and instream conditions during multiple wildland fire ignitions of all alternatives. Alternative II would have fewer miles of Priority 1 and 2 streams in areas available to livestock grazing than the No Action Alternative; it would have the same miles as Alternative III which is more miles than the other alternatives. Similar to Alternative III, it would pose the second greatest risk for impacts to riparian conditions of all alternatives. Alternative II would have the same amount of Priority 1 and 2 reaches in areas with limited travel designations as Alternatives III and VI, but more miles than the No Action Alternative and Alternatives I, IV, and V. ROW avoidance areas would include the same miles of perennial streams and Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, III, and IV. The risk for impacts to riparian condition are the same for these alternatives; more than would be expected for Alternatives V and VI. Alternative II has the most miles of Priority 1 and 2 reaches in the expected wind energy development areas and therefore would pose the greatest risk for impacts to riparian condition of all alternatives. Alternative II would have the most miles of Priority 1 and 2 reaches available for leasing of all alternatives and would pose the most risk for impacts to Priority 1 and 2 reaches of all alternatives. Alternative II would have the most miles of Priority 1 and 2 reaches available for geothermal leasing of all action alternatives and therefore would pose the most risk form impacts to riparian condition of all alternatives. This alternative would have the most Priority 1 and 2 reaches in areas available for salable mineral development and would pose the most risk for impacts to riparian condition of the action alternatives. Alternative II, similar to Alternative III, would have the second fewest miles of Priority 1 and 2 reaches recommended for withdrawal of all action alternatives. It would pose the second greatest risk for impacts to Priority 1 and 2 reaches; less than Alternative VI but more than the other alternatives. No ACECs would be designated under this alternative which would result in the fewest miles of PFC rated streams within areas of ACEC management of all alternatives.

Overall, Alternative II would result in minor to moderate short-term localized adverse impacts to riparian and wetland conditions due to the increased authorized uses. This alternative is expected to maintain or have minor to moderate localized improvements in to riparian and wetland conditions in the long term.

Impacts from Alternative III

Alternative III would maintain 85 miles of stream at PFC, achieve 98 miles of PFC, and move 42 miles of stream toward PFC over the life of the plan. This amount of riparian improvement is the same as for Alternatives IV, V, and VI, and more than for Alternatives I, II, and the No Action Alternative. This alternative would achieve riparian objectives slower than Alternatives I, IV, and V, similar to Alternative VI, but faster than the No Action Alternative and Alternative II, primarily due to the increased infrastructure for wildland fire suppression.

This alternative would have the second fewest miles of Priority 1 and 2 reaches in critical suppression areas for wildland fire; more than Alternative II but less than the other alternatives. It would rank second in risk for impacts to PFC ratings of all alternatives. The miles of Priority 1 and 2 reaches in areas available for livestock grazing would be the same as Alternative II; the impacts would be the same as Alternative II which poses the second most risk for impacts to riparian condition. Alternative III would have the same miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use as the No Action Alternative and Alternatives II and VI, but fewer miles than the other action alternatives. ROW avoidance areas would include the same miles of Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, II, and IV. The risk for impacts to riparian condition are the same for these alternatives; more than would be expected for Alternatives V and VI. Alternative III would have more miles of Priority 1 and 2 reaches in areas of expected wind development than Alternatives I, IV, and V but less than the other alternatives. It would rank fourth among the alternatives for risk to riparian areas due to expected wind energy development. Alternative III, similar to Alternative VI, would include more miles of priority streams in expected oil and gas areas available for leasing than Alternatives I, IV, and V but less than Alternative II. The effects to Priority 1 and 2 reaches for areas open to oil and gas leasing are slightly more than Alternative I. Alternative III would have fewer miles of Priority 1 and 2 reaches available for geothermal leasing than Alternative II, which has the most miles of all action alternatives. It would rank second in risk for impacts to riparian condition of all alternatives. This alternative, similar to Alternative VI, would have the second most Priority 1 and two miles available for salable mineral development of all alternatives; less than Alternative II but more than the other alternatives. Alternative III would have the same miles of perennial stream and the same miles of Priority 1 and 2 reaches recommended for withdrawal as Alternative II; the risk for impact are the same as Alternative II. Alternative III would rank fifth in the miles of Priority 1 and 2 reaches within ACEC management. It would have fewer risks for impacts to riparian and instream condition than Alternatives II and VI, but more than the other alternatives.

Overall, Alternative III would result in minor to moderate localized short-term adverse impacts to riparian areas and wetlands due to increased wildland fire-related infrastructure; however, some areas may experience moderate but extensive long-term beneficial impacts as riparian conditions are restored and impacts due to wildland fire are reduced.

Impacts from Alternative IV

Alternative IV would have the same miles of riparian area moving toward or achieving PFC as Alternative III, resulting in the same amount of improvement in riparian condition over the life of the plan. Alternative IV would have fewer authorized land uses and less wildland fire infrastructure than Alternatives III and VI. The rate of riparian improvement in Alternative IV would be faster than what is expected for the No Action Alternative and Alternatives I, II, III, and VI. This alternative is the most likely to achieve the objective of 98 miles of riparian area currently not at PFC achieving PFC. Alternative IV is most likely to facilitate the movement towards or the attainment of riparian objectives of all alternatives.

This alternative has the fourth most miles of Priority 1 and 2 reaches in critical suppression areas for wildland fire of all alternatives; less than the No Action Alternative and Alternatives IV-A and V but more than the other alternatives. Alternative IV would have more miles of Priority 1 and 2 reaches in areas available to livestock grazing than Alternative V but less than the other alternatives. Alternatives I, IV-A, and IV-B would pose essentially the same risk for impacts to riparian areas as they only vary by one mile of Priority 1 and 2 reach. Alternative IV would have fewer miles of Priority 1 and 2 reaches in areas with limited travel designations than Alternatives I, II, III, and VI but more than the No Action Alternative and Alternative V. ROW avoidance areas would include the same miles of perennial streams and Priority 1 and 2 reaches as the No Action Alternative and Alternatives I, III, and VI. The risk for impacts to riparian condition are the same for these alternatives; more than would be expected for Alternatives V and VI. Expected wind energy development areas for Alternative IV would affect the same miles of Priority 1 and 2 reaches as Alternatives I and V; they pose the least risk for impacts to riparian condition of all alternatives. Alternative IV would have the second fewest miles of Priority 1 and 2 reaches available for leasing; more than Alternative V but less than the other action alternatives. Alternative IV would have the second lowest risk for impacts to riparian areas of all alternatives. The types of impacts of geothermal exploration and development are the same as described for Alternative I, except fewer miles of Priority 1

and 2 reaches are in areas of expected geothermal development. Alternative IV-A would have the fewest miles of Priority 1 and 2 reaches available for geothermal leasing of all alternatives. Alternative IV would have slightly more miles of Priority 1 and 2 reaches available for salable minerals than Alternative V, which is the least of all alternatives. It would pose the second fewest risks for impacts to riparian area of all alternatives. Alternative IV would have more miles of Priority 1 and 2 reaches in areas recommended withdrawn from locatable mineral development than Alternatives II, III, and VI but less than Alternatives I and V. Alternative IV would rank third in risk for impacts to riparian conditions due to locatable mineral development. Alternative IV would rank second in the miles of Priority 1 and 2 reaches within ACEC management. It would have more risk for impacts to riparian and instream condition than Alternative V but less than the other alternatives.

Overall, Alternative IV would result in minor to moderate localized adverse impacts to riparian areas and wetlands in the short term from restoration treatments leading to moderate to major area-wide beneficial impacts and the fastest rates of recovery in riparian and wetland conditions in the long term.

Impacts from Alternative V

Alternative V would have the same miles of riparian area moving toward or achieving PFC as Alternatives III, IV, and VI, resulting in the same amount of improvement in riparian condition over the life of the plan. The passive restoration techniques emphasized in Alternative V would have fewer short-term impacts to riparian areas but longer timeframes for riparian objectives to be met. Alternative V is more likely to facilitate the movement towards the attainment of riparian objectives than the No Action Alternative and Alternatives I, II, III, and VI, primarily due to the decrease in authorized uses. It poses the least risk for impacts to riparian condition of all alternatives.

This alternative has the most miles of Priority 1 and 2 reaches within critical suppression areas for wildland fire of all alternatives and would have the least risk for impacts due to wildland fire. Alternative V would have the fewest miles of Priority 1 and 2 reaches available to livestock grazing and is the most likely to achieve riparian objectives relative to livestock grazing of all alternatives. For Alternative V, riparian areas with a reduced PFC rating due to existing recreation impacts would not be included in an SRMA and therefore are less likely to be improved due to SRMA management. Alternative V would have the fewest miles of Priority 1 and 2 reaches in areas with travel limited designations of all action alternatives. Alternative V, similar to Alternative VI, would have more miles of Priority 1 and 2 reaches in ROW avoidance areas than for the other alternatives. Alternative V, similar to Alternative VI, would pose the least risk for impacts to riparian condition and Priority 1 and 2 reaches of all alternatives. The expected wind development areas would affect the same miles of Priority 1 and 2 reaches as for Alternatives I and VI, which pose the fewest risks to riparian condition of all alternatives. Alternative V would have the fewest miles of Priority 1 and 2 reaches available for leasing in potential oil and gas areas of all alternatives and would have the least risk for impacts to riparian areas of all alternatives. Alternative V would have the second fewest miles of Priority 1 and 2 reaches available for geothermal leasing in areas with medium and low potential of all alternatives; more than Alternative IV-A but less than the other alternatives. This alternative would pose the least risk for impacts to riparian condition from salable minerals development of all alternatives. Alternative V would have the second fewest miles of Priority 1 and 2 reaches recommended for withdrawn from locatable mineral development; less than Alternative I but more than the other alternatives. It would pose the second fewest risk for impacts to riparian condition of all alternatives. Alternative V would have the most miles of Priority 1 and 2 reaches within ACEC management of all alternatives. It would pose the least risk for impacts to riparian and instream condition relative to ACEC management of all alternatives.

Overall, Alternative V would result in the fewest short-term adverse impacts to riparian areas and wetlands due to the reduced authorized uses and passive restoration techniques. This alternative is expected to result in moderate to major area-wide beneficial impacts to riparian and wetland conditions in the long term due to natural recovery after the reduction in authorized resource uses.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would have the same miles of riparian area moving toward or achieving PFC as Alternatives III, IV and V. It would have more authorized land uses and similar amounts of wildland fire

infrastructure as Alternative III and approximately the same amount of active restoration as Alternative IV. The rate of riparian improvement in Alternative VI would be faster than what is expected for the No Action Alternative and Alternatives I and II and similar to Alternatives III and IV.

Alternative VI would have the third fewest miles of Priority 1 and 2 reaches in critical suppression areas for wildland fire of all alternatives; more than Alternatives II and III but less than the other alternatives. Alternative VI would have fewer miles of Priority 1 and 2 reaches in areas available to livestock grazing than the No Action Alternative and Alternatives II and III. It would rank third in risk for impacts to Priority 1 and 2 reaches in areas available to livestock grazing of all alternatives. Alternative VI, similar to Alternative I, would have the greatest likelihood for reducing recreation-related impacts to Priority 1 and 2 reaches due to their inclusion in a SRMA. Alternative VI would have the same miles of Priority 1 and 2 reaches in areas closed to motorized and mechanized vehicle use as the No Action Alternative and Alternatives II and III which is less than the other alternatives. Alternative VI, similar to Alternative V, would have more miles of Priority 1 and 2 reaches in ROW avoidance areas than for the other alternatives. Alternative VI, similar to Alternative V, would pose the least risk for impacts to riparian condition and Priority 1 and 2 reaches of all alternatives. Alternative VI would rank third in risk to riparian condition from expected wind energy development; less than for the No Action Alternative and Alternative II but more than for the other alternatives. Alternative VI, along with Alternative III, would have the second highest miles of Priority 1 and 2 reaches available for oil and gas leasing; it would have the second highest risk for impacts to riparian condition within expected oil and gas development areas. Alternative VI would have fewer miles of Priority 1 and 2 reaches available for geothermal leasing in areas with medium and low potential than Alternatives II and III but more than Alternatives I, IV, and V. It would rank third in risk to riparian conditions due to geothermal development. Alternative VI would have the same miles of Priority 1 and 2 reaches in areas available for salable mineral development as Alternative III; the impacts are the same as Alternative III. Alternative VI, similar to Alternative III, would pose fewer risks for impacts to riparian condition due to salable minerals development than Alternative II but more than other alternatives. Alternative VI does not identify areas as recommended for withdrawal from locatable mineral development. Therefore, it would have the most miles of Priority 1 and 2 reaches in areas available for locatable mineral development and would pose the most risk for impacts to Priority 1 and 2 reaches of all alternatives. Except for Alternative II, Alternative VI would have the fewest miles of perennial stream and miles of Priority 1 and 2 reaches under ACEC management. Alternative VI would pose the second most risk for impacts to riparian and instream conditions relative to ACEC management.

Overall, Alternative VI would result in minor to moderate localized adverse impacts to riparian areas and wetlands in the short term but is expected to result in maintaining or moderate and extensive beneficial impacts to riparian areas and wetlands in the long term.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

This analysis considers the effects of past, present, and reasonably foreseeable actions on Federal, State, and private lands in and adjacent to the planning area in addition to the management in the alternatives. Management actions in the planning area may influence portions of the following three primary watersheds: Bruneau River, Salmon Falls Creek, and Snake River, which make up the cumulative impact analysis area. These primary watersheds include lands administered by the Bruneau, Burley, and Shoshone Field Offices; the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest; Hagerman Fossil Beds National Monument; Idaho Department of Lands, and the Nevada Division of State Lands. These watersheds also include private inholdings and two military withdrawal areas. Actions and activities in the identified watersheds that have influenced riparian condition in the past and have the potential to influence riparian condition in the future were considered in this cumulative impacts analysis.

Riparian areas and wetland are focus areas for many uses and, as a result, have been locally degraded over time. Factors that have contributed to current riparian condition include increases in the amount of noxious weeds and invasive plants, wildland fire and wildland fire suppression, livestock grazing, recreational uses, road construction and use, and the diversion of surface water. All of these factors have

reduced proper functioning condition (PFC) in the planning area over time and are expected to continue to influence riparian condition in the future. Activities on State and private land may continue to influence PFC ratings on the public land. As human population increases over time, the use of surface water that support riparian areas and wetlands is expected to increase.

Past, present, and reasonably foreseeable actions for the following resources and resource uses cumulatively affect riparian areas and wetlands:

- Noxious Weeds and Invasive Plants,
- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Transportation and Travel,
- Land Use Authorizations, and
- Minerals.

These actions are described in the *Introduction* to this chapter.

This cumulative impacts assessment used geographic information system data from adjacent Federal and State land management agencies to determine the watersheds with the potential to influence riparian condition within the planning area. Hydrologic boundaries were used to identify the drainage basins that flow into or through the planning area. These boundaries were used based on the assumption that ground-disturbing activities within the upper reaches of these watersheds had the potential to affect riparian and wetland condition in the downstream reaches, especially where those activities occur in Riparian Conservation Areas (RCAs). Geographic information system data is not available to assist in quantifying the type and amount of activities on private and State lands within the three primary watersheds.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Management actions implemented under the No Action Alternative combined with actions on Federal, State, and private lands, have contributed to the current condition of riparian areas and wetlands in the planning area. The No Action Alternative would reduce the likelihood for the 140 miles of riparian area not at proper functioning condition (PFC) to improve over the life of the plan. Some of this impaired condition is due to dewatering of streams for private uses under legal water rights granted by the State of Idaho.

Noxious weed and invasive plants have increased in the planning area since the 1987 Jarbidge RMP was completed. This increase in the occurrence of noxious weeds in the planning area may have contributed to the spread of noxious weeds to adjacent Federal, State, and private lands. Conversely, the areas adjacent to the planning area have been and are likely to continue to be a source of noxious weeds in the planning area. The occurrence and frequency of large wildland fires and wildland fire suppression activities have also increased on Federal, State, and private land in the cumulative impact analysis area, partially as a result of the increase in invasive plants as well as the increase in off-road motorized recreation and the open designation for cross-country motorized vehicle use. Trails, primitive roads, and infrastructure from uses such as livestock grazing, energy development activities, or minerals exploration or development are expected to result in a cumulative increase in impacts to riparian and wetland condition ratings. Impacts associated with resource uses under the No Action Alternative are expected to maintain or result in a cumulative decrease in riparian condition in the planning area over time.

Cumulative Impacts from Alternative I

In Alternative I, riparian and wetland areas would be expected to improve over the life of the plan. Management actions or authorized uses in RCAs would result in cumulative effects in addition to impacts from existing actions and uses. Restoration activities in the planning area would have short-term cumulative effects to PFC ratings but would improve condition ratings in the long term.

Wildland fires and wildland fire suppression are expected to continue on Federal, State, and private land in the analysis area. The development of new water sources for wildland fire suppression in addition to

existing water uses on Federal, State, and private land would increase impacts to riparian areas and wetlands. Building new roads and guard stations and creating fuel breaks in addition to those on Federal, State, and private land in the analysis area would also increase cumulative impacts to riparian areas and wetlands.

Livestock grazing on Federal, State, and private lands in the analysis area would continue to impact riparian and wetlands. As portions of Federal lands become unavailable for livestock grazing, the level of livestock use on other Federal, State and private lands are expected to increase. Grazing on State or private land where fencing or topography is insufficient to contain livestock grazing on Federal, State or private land would continue to pose an increased risk for cumulative impacts to riparian areas and wetlands on BLM-managed public lands.

Changes in travel management would limit motorized travel to designated routes and would reduce the number of new roads pioneered into RCAs, the spread of noxious weeds, and the potential for human-caused fires. Motorized recreation displaced from the planning area may result in an increase in this activity on adjacent private, State, and Federal lands that could increase impacts in riparian and wetland areas within the planning area. Reduced riparian condition upstream or downstream for RCA could result in loss of protective vegetation, increased erosion, and lowing of water tables that effect achieving objectives in RCAs within the planning area. Additionally, the anticipated increase in recreational use, combined with the authorization of cross-country motorized vehicle use for permit, lease, and right-of-way (ROW) holders would continue to pose an increased risk for a cumulative increase in roads, the spread of noxious weeds and invasive plants, and the potential for human-caused fires. Travel closures in the Bruneau-Jarbidge Rivers Wilderness would reduce cumulative travel-related impacts to RCAs in the Wilderness.

Uses such as oil and gas, wind energy, and geothermal development in the analysis area would create new roads and infrastructure on Federal, State, and private land in addition to existing roads and infrastructure. All of these activities would increase demands on surface and groundwater for project construction, operation, and maintenance that would result in additional impacts to riparian and wetland condition. These actions would have cumulative impacts to RCA condition ratings in the analysis area.

The cumulative impacts from implementing the restoration direction in the Aquatic and Riparian Management Strategy (ARMS) in Alternative I are expected to improve riparian and wetland condition more than is expected for the No Action Alternative.

Cumulative Impacts from Alternative II

In Alternative II, riparian and wetland condition may be maintained but would likely be locally reduced below the existing condition over the life of the plan. Management strategies most beneficial to commodity uses such as livestock grazing, transportation and travel, land use authorizations, energy development, and minerals exploration would be emphasized.

The cumulative effects of transportation and travel actions would be similar, but slightly less than Alternative I because fewer acres would be closed to motorized vehicles. Wildland fires and responsive wildland fire suppression are expected to continue in the analysis area. Improving roads and stream crossings and building new roads and guard stations are expected to increase road densities over the life of the plan in addition to the existing roads and infrastructure. Creating fuel breaks may help reduce wildland fire size and intensity, but these areas may provide a source of noxious weed and invasive plants that would reduce riparian condition over time.

Alternative II would include fuels treatments using prescribed burning and targeted grazing in addition to a substantial increase in permitted livestock grazing. This would be concurrent with an increase in areas available for oil and gas leasing, wind energy development, geothermal leasing, existing and new range infrastructure, existing and new water developments, and ROWs. All of these activities would result in an incremental increase in impacts to riparian and wetland condition. Several small wind projects exist on private land in the northern portion of the planning area, and a large wind energy project (China Mountain) is proposed in the southern portion of the planning area. These types of actions may continue

to increase on Federal, State, and private lands over the life of the plan and have additional cumulative effects to riparian areas and wetlands on Federal lands.

Implementation of the ARMS would moderate impacts to riparian areas and wetlands from authorized uses, but the direction would not moderate impacts from similar actions on Federal, State and private lands in the planning area or on Federal lands adjacent to the planning area. The cumulative impacts from implementing the restoration direction in the ARMS in Alternative II are expected to result in less improvement in riparian and wetland condition than the No Action Alternative and Alternative I because of the increased land uses.

Cumulative Impacts from Alternative III

In Alternative III, riparian and wetland condition would be maintained or improved but could be locally reduced below the existing condition over the life of the plan. Management strategies most beneficial for enhancing wildland fire suppression capabilities, managing fuels, and reducing wildland fire would be emphasized and would occur concurrently with uses such as livestock grazing, recreation, transportation and travel, land use authorizations, energy development, and minerals exploration. The potential increase in total animal unit months (AUMs) once upland vegetation objectives are achieved may impact a larger percentage of riparian areas and wetlands in the planning area than all other alternatives except Alternative II.

The cumulative effects of transportation and travel actions would be similar to Alternative II. The greatest increase in road and other infrastructure to enhance wildland fire suppression is expected to occur in Vegetation Management Area (VMA) B, which has first priority for wildland fire suppression during multiple ignitions and has the second most miles of riparian area not at PFC in the planning area. These new roads would result in a cumulative increase in road density within the cumulative impacts analysis area. Response time for wildland fire suppression would be shortened as a result of these additional actions and fewer miles of riparian area and wetland are expected to be affected by wildland fire. These additional roads, particularly of the roads in RCAs, are expected to have an increase in uses by other public land users and contribute to a cumulative increase in the spread of noxious weeds and invasive plants and potentially human-caused fires over the long term. There would be fewer acres of noxious weeds treated in Alternative III than all alternatives except Alternative VI. Similar increases in route density on Federal, State, and private lands in the analysis area are expected. New water developments created to enhance wildland fire suppression would occur simultaneously with the private land irrigation and livestock watering developments and would increase water demand on existing surface and groundwater resources. These increased water demands would primarily occur in VMA B where water resources are already limited.

Implementing the ARMS direction would moderate some of the impacts to PFC ratings in the planning area, but it would not moderate similar impacts on other lands within or adjacent to the planning area. Alternative III is likely to result in some improvement in riparian and wetland condition due to implementing the restoration direction in the alternatives and the ARMS, but the amount of improvement would be influenced by the increased wildland fire suppression infrastructure in addition to the current levels of authorized public land uses. Alternative III would result in more improvement in riparian and wetland condition than the No Action Alternative and Alternatives I and II. The likelihood of meeting riparian objectives over the life of the plan is more than Alternative I and similar to Alternatives IV, V, and VI.

Cumulative Impacts from Alternative IV

Alternative IV has fewer authorized public land uses and more active restoration of riparian areas and wetlands than Alternatives I, II, and III. The increased wildland fire suppression emphasis would be expected to result in fewer cumulative impacts from wildland fire on riparian areas and wetlands and a reduced potential for wildland fire to spread onto adjacent Federal, State, and private lands. VMA C and D have first and second priority for wildland fire suppression during multiple ignitions and contain 40% of all the riparian areas not at PFC for the planning area. Alternative IV has the most weed treatments of all alternatives and would reduce the spread of noxious weeds and invasive plants in the analysis area. The cumulative effects of transportation and travel actions would be similar to Alternative I. Establishing the

Bruneau-Jarbidge and Jarbidge Foothills Areas of Critical Environmental Concern (ACECs) would encompass half (76 miles) of the total miles of riparian areas not currently at PFC and would reduce cumulative impacts to these riparian areas.

Impacts to riparian areas and wetlands in the analysis area are expected to continue over the life of the plan. Implementation of the ARMS would moderate impacts to riparian areas and wetlands in the planning area from the above actions but would not moderate similar actions on other lands within or adjacent to the planning area. Alternative IV would result in improved riparian condition throughout the planning area and is the most likely to achieve riparian objectives over the life of the plan of all alternatives.

Cumulative Impacts from Alternative V

Alternative V relies on natural recovery rates for riparian areas not at PFC with limited active restoration. This alternative would have the least amount of public land uses of all alternatives and the fewest cumulative effects to riparian areas and wetlands. Alternative V includes no additional infrastructure for wildland fire suppression which would maintain or potentially increase the risk for impacts to riparian areas due to wildland fire. This alternative would have the least amount of permitted grazing of all alternatives including the No Action Alternative and therefore is expected to result in fewer cumulative effects to riparian areas and wetlands from livestock grazing in the planning area than in any other alternative. Grazing impacts may be shifted to other nearby lands which may result in cumulative effects to riparian areas on the public land.

Designating the Sagebrush Sea ACEC as a critical suppression area with management objectives that include minimizing public land uses would reduce the potential for impacts to riparian area and wetlands not at PFC and promote the maintenance of riparian areas currently at PFC. Large contiguous ACECs which overlap and are adjacent to the Wilderness Study Area, Wild and Scenic Rivers, lands managed for wilderness characteristics, and the Bruneau–Jarbidge Rivers Wilderness could decrease the potential for cumulative impacts to PFC ratings on the public land within the planning area. However, this alternative places the most restrictions on motorized travel and recreation resulting in the highest displacement of motorized recreation of all alternatives. Motorized recreation displaced from the planning area may result in an increase in this activity on adjacent private, State, and Federal lands that could increase impacts in riparian and wetland areas within the planning area. Reduced riparian condition upstream or downstream for RCA could result in loss of protective vegetation, increased erosion, and lowing of water tables that effect achieving objectives in RCAs, Impacts from activities and authorized uses on Federal, State and private land would continue to occur and result in cumulative impacts to riparian areas and wetlands on the public land.

Impacts to riparian areas and wetlands in the analysis area are expected to continue to occur over the life of the plan. Implementation of the ARMS would moderate impacts to riparian areas and wetlands in the planning area from the above actions but would not moderate similar actions on State and private land in the planning area or on Federal lands adjacent to the planning area. Alternative V would result in improved riparian condition throughout the planning area but at a slower rate of recovery than Alternative IV. Fewer cumulative impacts are expected to occur to PFC ratings than for all other alternatives.

Cumulative Impacts from Alternative VI (Proposed RMP)

Similar to Alternative III, management strategies most beneficial for enhancing wildland fire suppression capabilities, managing fuels, and reducing wildland fire would be emphasized and the emphasis on active restoration would be the same as Alternative IV. These would occur concurrently with uses such as livestock grazing, recreation, transportation and travel, land use authorizations, energy development, and minerals exploration. The potential increase in total AUMs once upland vegetation objectives are achieved may impact additional riparian areas and wetlands in the planning area, although the additional allocated forage would not occur in riparian areas and the direction in the ARMS would be used to maintain or improve riparian condition and PFC ratings. Overall, cumulative impacts to riparian areas and wetlands for Alternative VI would be most similar to Alternative III.

Cumulative impacts related to wildland fire suppression and increased wildland fire suppression infrastructure for Alternative VI would be similar to Alternative III. The greatest increase in road and other infrastructure to enhance wildland fire suppression is expected to occur in VMA B, which has the second priority for wildland fire suppression during multiple ignitions and has the third most miles of riparian area not at PFC in the planning area. These new roads would result in a cumulative increase in road density within the cumulative impacts analysis area. Response time for wildland fire suppression would be shortened as a result of these additional infrastructure and fewer miles of riparian area and wetland would be affected by wildland fire. These additional roads, particularly the roads in RCAs, are expected to contribute to a cumulative increase in the spread of noxious weeds and invasive plants and potentially human-caused fires. There would be fewer acres of noxious weeds treated in Alternative VI which could result in a cumulative increase in noxious weeds and invasive plants in RCAs. New water developments created to enhance wildland fire suppression would occur simultaneously with the private land irrigation and livestock watering developments and would increase water demand on existing surface and groundwater resources. These increased water demands would also impact riparian conditions within the cumulative impacts analysis area.

Alternative VI would have a similar number of perennial stream miles and miles of Priority 1 and 2 reaches in areas available to livestock grazing as Alternative I and more authorized AUMs than the No Action Alternative and Alternatives I, IV, and V, but less than Alternatives II and III. Cumulative impacts to riparian areas and PFC ratings due to public land livestock grazing, combined with impacts from livestock grazing on Federal, State and private land would be more than is expected for Alternative I but less than for Alternatives II and III. Alternative VI, similar to Alternative IV, emphasizes active restoration and is likely to result in slightly fewer road-related cumulative impacts to PFC ratings because more miles of road in RCAs are likely to be improved or modified to reduce impacts to riparian areas. The cumulative effects of transportation and travel actions would be the same as for Alternatives II and III; Cumulative impacts related to oil and gas and geothermal development would be similar to Alternative III.

Impacts to riparian areas and wetlands in the analysis area are expected to continue. Implementation of the ARMS would moderate some of the impacts to riparian areas and wetlands in the planning area, but it would not moderate similar actions on State and private land in the planning area or from adjacent Federal lands. Alternative VI, similar to Alternative III, is likely to result in some improvement in riparian and wetland condition due to implementing the restoration direction in the ARMS, but the amount of improvement would be limited by the increased wildland fire suppression infrastructure in addition to the current levels of authorized public land uses. The cumulative impacts to riparian areas and wetlands from implementing Alternative VI are expected to be most similar to Alternative III with cumulative impacts due to active restoration being similar to Alternative IV.

4.3.6. Fish and Wildlife

4.3.6.1. Fish

Native non-game fish differ from special status fish in that they can tolerate warmer water temperatures and smaller, shallower streams. Like special status fish, native non-game fish have habitat requirements that generally include stream channels with low instream fine sediments, cool water temperatures, suitable streamflows for successful spawning and fish passage, and water quality with minimal nutrient contamination. Management actions that reduce, maintain, or improve proper functioning condition and habitat condition ratings in habitats for special status fish would have the same effects to native non-game fish habitat. For this reason the analyses for special status fish and native non-game fish have been combined. See the *Special Status Fish and Aquatic Invertebrates* section.

4.3.6.2. Wildlife

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to wildlife:

- **Acres with active restoration of shrubs on big game winter range** – This indicator was selected to quantify differences in amounts of restoration of big game winter range between alternatives.
- **Change in upland acres of wildlife group habitats** – This indicator was selected to quantify relative changes to wildlife group habitats based on vegetation treatments between alternatives.
- **Miles of riparian areas meeting or planned to be restored and managed to achieve proper functioning condition (PFC)** – This indicator is used to compare the amount of riparian area at PFC and riparian restoration between alternatives. The more miles of riparian areas at PFC, the better the habitat is for the riparian group wildlife.
- **Acres with management emphasis** – This indicator provides a mechanism to compare acreage between alternatives with management emphasis. Management emphasis would increase (e.g. areas managed for motorized recreation) or decrease (e.g. exclusion areas, avoidance areas with restrictions or stipulations, etc.) disturbance or infrastructure to wildlife or wildlife group habitat. Changes in the amount of infrastructure would decrease or increase habitats and human disturbance.
- **Relative change in the amount of cover for wildlife** – This indicator compares relative amounts of herbaceous cover available to wildlife for nesting, thermal, or security cover between alternatives. In general areas with more cover provide more higher levels of security for wildlife.
- **Acres in the Sikes Act Wildlife Program (wildlife tracts)** – The emphasis of wildlife tracts would be upland game (e.g., pheasant, quail, gray partridge, cottontail rabbit), but other wildlife benefit as well. Fences, guzzlers and habitat restoration would be used to protect and improve habitat on tracts.

Only those indicators relevant to the management in each section were used in the analyses.

Methods and Assumptions

Impacts to wildlife from management in the following sections of Chapter 2 were analyzed in detail: *Wildlife*, *Vegetation Communities* (including *Upland Vegetation* and *Riparian Areas and Wetlands*), *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations*, *Minerals*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for wildlife. Impacts from management actions for wildlife on other resources and resource uses can be found under *Impacts from Wildlife Actions* in the *Tribal Rights and Interests, Transportation and Travel, Land Use Authorizations*, and *Economic Conditions* sections.

To calculate acres of active restoration of shrubs in big game winter range, geographic information system data layers (e.g., vegetation, wildland fire suppression priorities) were used, when possible, to determine overlap with big game winter range for each alternative. Assumptions for this analysis include the following:

Increases in the amount of big game winter range with desirable browse would be beneficial to mule deer and pronghorn.

Change in acres of wildlife group habitats were analyzed based primarily on changes of acres of type of restoration. To the extent possible, the analyses were quantitative and based primarily on the vegetation section. Assumptions for this analysis include the following:

- Increases in habitat for sagebrush steppe and mountain mahogany/mountain shrub would benefit wildlife species in those habitat groups. Conversely, increases in habitat for sagebrush steppe or mountain mahogany/mountain shrub groups will result in a decrease in habitat for grassland group species as shrub cover and height increases and more closely resembles sagebrush steppe (McAdoo et al., 1989).
- Canyonland habitats are influenced by topography and geology as well as vegetation.
- Aspen stands are limited in the planning area and are predominantly influenced by soils and moisture.
- Restored areas (e.g., seeded or planted to shrubs or trees) would typically more than 15 year for the shrub or tree component to attain the structure (height, diameter and/or canopy cover) to function similarly to intact mature habitat within a group community. Restored habitats which take longer to become functional include sagebrush steppe (Baker, 2006; Connelly et al., 2004; Howard, 1999;

Steinberg, 2002; Wright et al., 1979), mountain mahogany/mountain shrub (Gucker, 2006; Johnson, 2000), and aspen (Dobkin et al., 1998; Howard, 1996).
- Dominant late-successional grasses in the planning area typically recover to pre-treatment density and production within five or more years (Wright et al., 1979).

Miles of riparian areas to be restored and managed to achieve PFC were analyzed based primarily on the number of miles perennial riparian areas, or miles of riparian area which had attained PFC and additional miles targeted to achieve PFC. Assumptions for this analysis include the following:

- Riparian areas which have achieved PFC have quality habitat for riparian group wildlife than riparian areas which have not achieved PFC. Riparian area function relates to vegetation composition and height, stream bank stability, channel morphology within the land form, and water table depth.
- Attainment of PFC is minimum needed for proper riparian function. This minimum is not the same as late-successional riparian communities. It takes longer for trees and shrubs to attain full size (Dobkin et al., 1998; Schulz and Leininger, 1991) than herbaceous vegetation. Willows, aspen, and other woody species provide the structure needed by flycatchers, warblers, woodpeckers and other species for nesting and foraging.
- Beaver ponds improve riparian habitat used by a variety of wildlife. Water storage reservoirs, stock ponds, and troughs are used by wildlife as water sources.

Acres with special management were quantitatively and qualitatively analyzed based on availability (such as open, available, available with constraints, closed, etc.) or management focus (such as restoration, reducing route density, critical suppression areas, primitive recreation, etc.) of an area. Assumptions in this analysis were:

- Areas closed or excluded to uses or activity would not be impacted by that activity, whereas areas open or available would likely be influenced by the activity.
- Areas open or available for resource uses would increase additional resource use and infrastructure. In general, new routes form with infrastructure for project construction and maintenance. If a discrete acreage was projected for use (gravel pits, reasonably foreseeable development scenarios, etc.), this impact analysis looked at a more limited area rather than the entire open or available area.
- Special management based on season, distance, or priority may eliminate, reduce, or promote some effects.
- Roads reduce and divide habitat (Forman and Alexander, 1998, Sawyer et al., 2007) and are a source of wildlife mortality (Jochimsen, 2006). Wildlife killed on roads augment food for scavengers and some predators. Some birds nest at lower densities near roads compared to similar habitat without roads and other birds such as horned lark are attracted to the open or edge area and may compete with shrubland birds (Ingelfinger and Anderson, 2004).
- Power poles, communication towers, fences, and corrals provide raptors and raven additional perching or nesting sites (Steenhof et al., 1993), which may alter habitat use by some wildlife, or increase predation locally at some distance from the structure (Armentrout and Hall, 2006).
- Infrastructure with wires are a source of collision mortality to wildlife. (Beck and Mitchell, 2000; Connelly et al., 2004; Harrington and Conover, 2006; Rowland et al., 2000; Steenhof et al., 1993) and may improve habitat for some wildlife species.
- Human disturbance or occupancy increases displacement of wildlife and temporal or spatial habitat fragmentation or abandonment. Increased human presence for access, recreation (Cassirer et al., 1992; Miller et al., 1998, 2001) or during maintenance can displace wildlife. Conversely some wildlife are attracted to areas of human disturbance particularly when a limited resource (food, water, nesting places) is created or augmented (Blakesley and Reese, 1988; Webb et al., 2009).
- Infrastructure influences an area substantially larger than the actual ground disturbance or project footprint. A before and after development study by Sawyer and others (2006) reported that use of mule deer winter range was altered by an oil field and displacement occurred over a three-year period.
- In arid areas, artificial water sources provide water for a variety of wildlife (O'Brien et al., 2006), particularly in a drought (Tuttle et al., 2006), and attract wildlife to those sites.

- Some wildlife species habitat to some disturbances more readily than other wildlife species. Individuals within a species do not all react the same to the same disturbance.
- Mitigation to restore habitat would be successful in the long term.

Relative change in the amount of herbaceous cover and forage for wildlife was qualitatively analyzed based on the percent vegetation remaining following use at specific levels. Assumptions for this analysis include the following:

- Current year and/or residual herbaceous vegetation influences nesting, thermal, and security cover for wildlife both positively and negatively. For example, mule deer in the Sierra Nevada of California avoid aspen stands with reduced security cover for fawns in the early summer (Loft et al., 1987). Herbaceous cover that provided greater than or equal to 40% vegetative cover at greater than or equal to 10 inches tall provided suitable habitat for Savannah sparrow (Swanson et al., 1999) and grasshopper sparrow (Dechant et al., 2003e). However, long-billed curlew (Dugger and Dugger, 2002) and horned larks (Beason, 1995) generally prefer to nest in areas with shorter vegetation (greater than or equal to four inches).

The analysis for the Sikes Act wildlife tract program (wildlife tracts), the analysis focused on total tract acreage, infrastructure, and restoration on the wildlife tracts. This analysis included the following assumption:

- Increasing acreage, tract size, and improving habitat (restoration and guzzlers) would benefit wildlife occurring on wildlife tracts.

Direct and Indirect Impacts

Impacts from Wildlife Actions

The following indicators were used to analyze the impacts of Wildlife actions on wildlife habitat:

- Acres with active restoration of shrubs on big game winter range,
- Change in upland acres of wildlife group habitats, and
- Acres in the Sikes Act Wildlife Program (wildlife tracts).

Impacts from Management Specific to the No Action Alternative

Restoration or improvement of 9,000 acres of winter range would be less than 1% of the big game winter range and does not address the restoring large areas of winter range burned since 1987. Establishing bitterbrush, sagebrush and other shrubs on mule deer or pronghorn winter range would increase and improve habitat for wintering big game in localized areas in the long term.

Grassland habitat would remain relatively contiguous benefiting grassland group wildlife such as savannah and grasshopper sparrows, short-eared and burrowing owls, horned lark, and western meadowlark.

The No Action Alternative would keep the wildlife tract in its present configuration with over 13,000 acres (Map 18). The original habitat management plan was prepared in the mid-1970s. Special management in the plan included direction for cooperative farming agreements, grazing, infrastructure (fences and guzzlers), and habitat restoration. Although several miles of fence were installed in the 1970s and into the 1990s, another approximately 70 miles of new fence would be needed to restrict livestock from all the unfenced wildlife tracts within grazing allotments.

Fencing wildlife tracts may slightly increase wildlife mortality locally. Mortality of a variety of wildlife species from collisions with fences has been documented, including waterfowl, raptors, songbirds (Allen and Ramirez, 1990; Connelly et al., 2004, Stevens 2011) and big game (Harrington and Conover, 2006). Ecological effects of fences on birds in sagebrush steppe habitat are poorly understood. A recent study in southern Idaho (Stevens, 2011; Stevens et al., 2012) found 15 species of birds incurred mortality from fence strikes. Although fences provide perch sites for songbirds during the breeding season, they also

provide perches for brown-headed cowbirds, magpies, raptors, and ravens which may increase nest predation near fences. Mortality appears higher for larger birds such as grouse, hawks, owls, and waterfowl (Allen and Ramirez, 1990; Stevens, 2011, Stevens et al., 2012) than for smaller birds such as sparrows. Local changes in wildlife mortality due to fence would be negligible to minor in the short and long term.

There has been some issues (water quality, disease, predation, drowning, and competition) regarding the impacts of guzzlers and other artificial water sources on wildlife. In other areas researchers have documented a wide variety of wildlife using guzzlers and water catchments including bats, dove, quail, chukar, as well as a variety of non-game birds and mammals (O'Brien et al., 2006; Simpson et al., 2011). A similar variety of wildlife use would be expected to occur at guzzlers on wildlife tracts. Although limited predation attempts and drowning have been documented, in general artificial water sources are believed to be beneficial for wildlife (Simpson et al., 2011). However, impacts of guzzlers and water catchments to wildlife populations are not well researched in most of the western United States.

Impacts from Management Specific to Alternative I

Wildlife management actions call for treatments to increase desirable shrubs (bitterbrush, four-wing saltbush, sagebrush, etc.) on big game winter range. Approximately 121,000 acres of big game winter range would be improved to increase shrubland winter range from 300,000 to 421,000 acres. The increased browse on winter range would provide cover to mule deer as well as above snow browse.

Restoring big game winter range would convert grassland group habitat to sagebrush steppe, and to a lesser extent mountain mahogany/mountain shrubland over time benefitting wildlife in these groups. However, the acres of grassland habitat would be reduced over time as the restored areas matured. Grassland group habitat would decline by the same acreage in the long term.

Wildlife tracts would be realigned (Map 18) and the acreage would be increased from 13,000 acres to 20,000 acres. The tracts would become larger and more efficient restore and manage. Realignment would include a number of ungrazed areas, including BLM lands along the west side of Salmon Falls Creek Canyon north of Balanced Rock Crossing. Value to pheasant, gray partridge, chukar, and California quail, in this area is high due to the proximity to the canyon and the riparian area in the bottom of the canyon. Larger wildlife tracts would provide larger blocks of habitat, likely improving survival and reproduction of wildlife using the tracts.

In cooperation and coordination with the Idaho Department of Fish and Game and partners (e.g., Sportsmen for Fish and Wildlife, Pheasants Forever, or Mule Deer Foundation) a new management plan would be prepared for the wildlife tracts. The plan would include special management on about 20,000 acres and specific projects (e.g., fences, guzzlers, and habitat restoration) and priorities to improve grassland and sagebrush steppe group habitats. The wildlife tract plan would implement special management with respect to invasive plants, restoration, land use authorizations, and minerals would be addressed.

Wildlife-related infrastructure would be focused on fencing to protect the wildlife tracts. An estimated 45 miles of new fence would be needed to protect the realigned tracts. Where possible, fences would tie into existing fences on BLM land or private land which may reduce the amount of new fence. New fences and locations of new guzzlers would be analyzed in detail with a new tract management plan for the planning area. Construction of new fence and installation of guzzlers would occur primarily in the late summer to early winter after the nesting season.

Interseeding forbs including alfalfa would enhance pheasant nesting (Mathews et al., 2012) whereas establishing shrub patches would improve winter habitat (Giudice and Ratti, 2001). As areas planted to shrubs mature and shrub density increases, there would be a decline in grassland habitat. As habitats at treated areas shift from grassland to shrub steppe use by grassland species would decrease and use by sagebrush steppe species would increase. In the short term, effects from management to wildlife would be minor at the local scale and negligible at the planning area scale. As a result of changes in habitat, effects from management to upland game would be moderately beneficial at the local scale and negligible at the planning scale over the long term.

Impacts from Management Specific to Alternative II

Management actions provide for the restoration big game winter range burned in wildland fires. Re-establishing browse would provide an above snow food source for big game in the long term. The amount of winter range (native shrubland) would remain static in the long term.

Shrublands would be maintained on roughly 347,000 acres whereas grassland habitats would occur on 977,000 acres.

The acreage in the wildlife tracts would change from over 13,000 acres to less than 10,000 acres (23% decrease), reducing habitat for upland game and other wildlife. Most wildlife tracts within allotments would be dropped (Map 18). Other tract realignment is expected to be minimal under this alternative. The remaining small wildlife tracts would continue to function as areas with negative population growth, minimizing management effects to wildlife. The effect of reducing the amount of acres would be a minor decrease in habitat for upland game at the local scale and a negligible decrease at the planning area scale.

A new management plan would be developed and implemented for the remaining tracts in the program. The amount of new fence would total about 25 miles due to dropping most of the wildlife tracts within grazing allotments. A number of guzzlers would be installed in the Bell Rapids, Blue Gulch, and Grindstone areas. Special management would be applied on the 10,000 acres to address noxious weeds and invasive plants, land use authorizations, grazing, and minerals. New fences and locations of new guzzlers would be analyzed in detail with a new tract management plan for the planning area.

Impacts from Management Specific to Alternative III

Management actions provide for the restoration of some big game winter range. Approximately 155,000 acres big game winter range would be restored in Alternative III improving cover and above snow browse. The majority of game winter range restoration would occur in areas which overlap Areas of Critical Environmental Concern and sage-grouse habitat.

Habitat for the sagebrush steppe and to a lesser degree mountain mahogany/mountain shrub groups would increase long term on restored winter range. Habitat for the grassland group would decline the same amount as restored sagebrush steppe areas mature expand in the long term. Sagebrush steppe would become more continuous. Effects to group habitats would be moderate at the local scale and minor at the planning area scales.

Wildlife tracts would be realigned and the acreage would be increased slightly (300 acres, Map 18). A new management plan would be developed implemented for the remaining tracts in the program. Most wildlife tracts within allotments would be dropped. Realigning the remaining tracts would require roughly 30 miles of new fence. Guzzlers would be placed on the majority of wildlife tracts to enhance habitat locally. Improved habitat would be due primarily to restoration of shrubs and forbs. Wildlife tract realignment would increase management, protection and restoration efficiency on about 14,000 acres. Shrubs and forbs would be planted to improve habitat for pheasants and gray partridge. Special management implemented on the wildlife tracts plan would help reduce invasive plants, restore habitat, and provide direction for land use authorizations, minerals, and grazing. Long-term effects of management of the wildlife tracts would be moderate increase winter habitat upland game at the local scale and negligible increase at the planning area scale.

Impacts from Management Specific to Alternative IV

Management actions provide for the restoration of big game (mule deer and pronghorn) winter range. Desirable browse would be restored on approximately 339,000 acres of big game winter range in Alternative IV. Restoration would make winter range more continuous and improve cover and above snow browse for mule deer and pronghorn in the long term.

The long-term native shrubland objective would primarily increase sagebrush steppe and to a lesser extent mountain mahogany/mountain shrub group habitats and decrease grassland group habitats. Sagebrush steppe would become more continuous as restored areas matured.

The change to the configuration of wildlife tracts would be the same as Alternative III (Map 18). New fence to protect wildlife tracts would total about 30 miles. Guzzlers would be placed on an unknown number of tracts. Impacts of realigning and increasing the acreage in the wildlife tracts would be the same as in Alternative III.

Impacts from Management Specific to Alternative V

Management actions provides for restoring mule deer and pronghorn winter range. Desirable browse would be restored on approximately 223,000 acres of big game winter range in Alternative V, improving habitat for mule deer and pronghorn in the long term.

Primarily sagebrush steppe and to a lesser extent mountain mahogany/mountain shrub habitats would increase on the restored winter range in the long term, reducing grassland group habitat. Shifts in group habitat would result in a moderate long-term increase in primarily sagebrush steppe group habitat with a long-term decline in grassland group habitat at the local scale. The shift in habitat from 223,000 acres grassland to primarily sagebrush steppe would be minor to moderate at the land scape scale in the long term.

The acreage and configuration of the wildlife tracts would be the same as Alternative III (Map 18). Realigning the remaining wildlife tracts and implementing a management plan would result in a small increase in wildlife tract acreage, approximately 30 miles of new fence. An unknown number of guzzlers would be placed on the majority of tracts to enhance habitat locally. Special management in the plan would address invasive plants, land use authorizations, minerals, and grazing.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Approximately 308,000 acres of big game winter range within areas restored to sagebrush steppe or mountain mahogany/mountain shrub would be improved first, consistent with priorities in the Upland Vegetation section. Over time big game winter range would become more continuous as restored sagebrush steppe and mountain mahogany/mountain shrub mature. Restoration of shrubs is expected to enhance habitat more for mule deer and pronghorn whose diets include a relatively high proportion of browse. Wildlife in the sagebrush steppe/mountain mahogany groups would also benefit.

The long-term big game winter range restoration would primarily increase sagebrush steppe and to a lesser extent mountain mahogany/mountain shrub habitats. A corresponding long-term decline would occur to grassland group habitat as restored areas matured.

Wildlife tracts would be realigned and the acreage would be increased by 500 acres rather than 300 acres (Map 19). Most wildlife tracts within grazing allotments would be dropped. Realigning the remaining wildlife tracts and implementing a wildlife tract management plan would require an estimated 35 miles of fence around the tracts and an unknown number of guzzlers on the tracts. Restoring habitat on the tracts to create patches of dense shrubs would enhance winter cover and nesting for some wildlife species. Increasing perennial forbs is expected to improve overall habitat quality and create nesting cover for pheasants and gray partridge. Special management in the plan would address invasive plants, land use authorizations, minerals, and grazing.

Impacts from Vegetation Communities Actions

Changes in vegetation communities from one vegetation sub-group (VSG) to another (e.g., Non-Native Perennial Grassland to Non-Native Understory or Native Grassland to Native Shrubland) alter the associated wildlife composition (Knick and Rotenberry, 1995; McAdoo et al., 1989). For example, as shrub cover and height increase so does use of the habitat by shrub-nesting birds. Conversely, the removal of shrub cover eliminates the nesting structure for shrub-nesting species, but promotes habitat for grassland species. Shrub restoration would improve habitat for the sagebrush steppe, riparian, and mountain mahogany/mountain shrub group habitats. Smaller patches of shrubland linking large habitat areas (stepping stone connectivity) restore movement routes for wildlife (Dramstad et al., 1996) in the sagebrush steppe, mountain mahogany/mountain shrub, and riparian groups.

Prescribed fires would typically be conducted from early September into December, depending on the treatment objectives. Prescribed burning during these times is expected to have minimal impacts to most bird species since they have finished nesting for the year. Sagebrush would be reduced most by prescribed burning. However, human disturbance, as well as fire and smoke during the prescribed burn, may temporarily displace some mammals and resident birds. Prescribed fires would reduce grassland group habitat for at least one growing season. Recovery of the some shrubs (sagebrush, bitterbrush) may take substantially longer for to resemble unburned areas. Initially some wildlife may be reduced or absent from burned areas due to the lack of vegetative cover. Big game may concentrate in burned areas during green up.

Dixie harrow treatments would reduce the amount of primarily sagebrush at sites. Some sagebrush would remain and continue to provide some shrub structure needed by some wildlife. Depending on plants species present in the understory, native forbs and grasses may increase. In Wyoming big sagebrush habitat in Colorado, Dixie harrowing small patches (about 15 acres) did not reduce the nest success of shrub nesting birds (vesper sparrow, sage thrasher, green-tailed towhee, Brewer's sparrow) in the two years following treatment (Magee et al., 2011).

Winter aerial seeding of sagebrush and associated human activity (e.g., aircraft, vehicles, and noise) may temporarily displace some wildlife from treatment areas and result in an increase in energy expenditure. Drill seeding is usually conducted in the fall, which avoids the bird breeding season. Winter seeding of shrubs would have a negligible impact on sagebrush steppe and mountain mahogany/mountain shrub habitats at the local and planning area scales in the short term. Long term, aerially seeding shrubs would have a moderate to major beneficial impact to sagebrush steppe habitat at the local scale. At the planning area scale the effects would be moderate and beneficial to wildlife in the sagebrush steppe and mountain mahogany/mountain shrub groups. In the long term, impacts would be negative and moderate at both the local and planning area scales for the grassland wildlife group.

Drill seeding can result in damage to rodent burrows and may result in injury or mortality to individuals in shallow burrows (BLM, 2007b). Mechanical treatments such as interseeding with rangeland drills may have a minor impact on small mammals in the short term (Borchgrevink et al., 2010). Using depth bands, which limit the depth the disk cuts, can reduce this impact. Impacts to burrowing animals would be short-term and localized to the treatment area.

Planting shrub seedlings manually or with a tree/shrub planter may occur in the spring and fall. Human disturbance associated with spring or fall planting would temporarily displace wildlife in the area to be planted. Planting shrubs would benefit the sagebrush steppe and mountain mahogany mountain shrub wildlife in the long term at the local scale.

To the extent practical, vegetation treatments would be scheduled to minimize or reduce human disturbance during important seasons for wildlife. Important wildlife periods include winter for most wildlife, spring for nesting birds, birthing for big game, and early summer for some songbirds. The use of heavy equipment (e.g., tractors, bull dozers, rangeland drills), transport vehicles, and support crews is expected to temporarily displace some wildlife during treatments.

The following indicators were used to analyze the impacts of Vegetation Communities actions on wildlife habitat:

- Change in upland acres of wildlife group habitats and
- Miles of riparian areas meeting or planned to be restored and managed to achieve proper functioning condition (PFC).

Impacts of targeted grazing as a vegetation treatment tool are discussed under Impacts from Fuels Treatments.

Impacts from Management Specific to the No Action Alternative

Management under the No Action Alternative has resulted in a decrease in the amount of sagebrush steppe and mountain mahogany/mountain shrub habitat and an increase in the amount of grassland

habitat. Wildland fire has contributed substantially to this change. Limited restoration would be unlikely to convert grassland to shrubland in the short or long term.

Riparian fencing and woody species planting projects would continue to be implemented to preserve, protect and restore natural function of riparian areas. Habitat for riparian group wildlife would improve most rapidly in the fenced riparian areas. The establishment of willows or other woody plants would provide long-term structure for nesting, foraging, and cover for wildlife using riparian areas. Fences would be a minor source of mortality for some wildlife, primarily birds. The No Action Alternative does not address beaver introductions to improve habitat, which would not automatically preclude transplants.

Table 4-112. Long Term Changes to Shrubland and Grassland Due to Vegetation Treatments by Alternative

Category	Alternative						
	No Action	I	II	III	IV	V	VI
Long-term native shrubland objective (acres)[A]	325,000	630,000	347,000	566,000	948,000	520,000	830,000
Long-term grassland objective (acres)	998,000	694,000	977,000	738,000	376,000	804,000	493,000
Long-term riparian areas at or achieving PFC	85	145	85	183	183	183	183

[A] The majority of the acreage would be sagebrush steppe.

Impacts from Management Specific to Alternative I

Some of the restoration activities in Vegetation Management Area (VMA) C (110,000 acres) would focus on big game winter range. The long-term native shrubland objective would be 694,000 acres. Priorities for restoration would be VMAs A and C. Restoration would have a negligible impact on wildlife in the short term in grassland, mountain mahogany/mountain shrub and sagebrush steppe group habitats. In the long term, restoration would increase habitat primarily for wildlife for the sagebrush steppe group and to a lesser extent to wildlife in the mountain mahogany/mountain shrub group and reducing grassland group habitat by 327,000 acres. Long-term restoration would result in a moderate to major increase in habitat for the sagebrush steppe group at the local scale and a minor to moderate increase at the planning area scale. Restoration would also result in a moderate decline of grassland group habitat at the local scale and a minor decline at the planning area scale.

Vegetation treatments that convert annual grassland to non-native perennial grassland would not change overall amount of grassland habitat. However, seeding mid-size bunch grasses could improve habitat quality for wildlife in the grassland group by altering grass structure (height and growth form) compared to annual grasses. In Montana, areas of annual grass dominated by tall dense cheatgrass were abandoned by most grassland birds (Hendricks et al., 2007). In northern Utah cheatgrass dominated areas supported fewer racers and gopher snakes (Hall et al., 2009) and deer mice (Hall, 2012) than areas with sagebrush. Cheatgrass dominated areas supported lower densities of all rodent species than shrubland habitats in Washington (Gano and Rickard, 1982) and Idaho (Groves and Steenhof, 1988). Within the planning area annual grassland habitat had the fewest small mammal captures and number of species (Klott et al., 2007). In general, treatments aimed at converting annual grassland to other grassland or shrubland habitat could improve habitat for grassland wildlife. Some invasive annual forbs may also decrease following treatments. Grassland treatments would be minor at the local scale and minor to negligible at the planning area scale in the short and long term.

Riparian habitat would improve in the long term through implementation of riparian and fish restoration and protection efforts on the 60 miles of riparian areas which attain PFC. Projects that include establishing sedges or planting willows or trees (Hall et al., 2011) would result in stream shading for fish while also improving nesting structure, hiding cover, and foraging habitat for wildlife species in the riparian areas. Occasionally straw bales or gabions could be used to restore down cut segments in the upper part of some watersheds. This treatment would help retain sediment and water in the area. In long term, the

restoration would extend the duration of water flows downstream. Attainment of PFC on 145 miles of riparian zones would increase or improve habitat for wildlife in the riparian group.

Beaver re-introductions in some watersheds would result in the creation of more ponds that could be used by songbirds, waterfowl (Cooke and Zack, 2008), some shorebirds, and amphibians. Beaver would initially reduce woody vegetation and shade near the creek in the short term by cutting trees and willows. Raised water tables and trapped sediment in ponds would encourage the establishment of additional wetland herbaceous and woody species expanding riparian areas (Pollock et al., 2007). In Oregon beaver shortened recovery time for an incised stream (Pollock et al., 2007), similar results would be expected in some creeks.

Improvement in the unfenced riparian areas would be achieved through management direction to ensure activities maintain, enhance or restore riparian group habitat. Even though 80 miles of riparian areas may not achieve PFC over the life of the plan, riparian management direction for all action alternatives provide direction to maintain and improve habitat to riparian group wildlife.

Impacts from Management Specific to Alternative II

Vegetation treatments in VMAs A and B would shift annual grassland to perennial grasslands. Over 85,000 acres of treated annual grassland would be converted to non-native perennial grassland maintaining grassland group habitat, with the same impacts described in Alternative I.

Grassland habitats would increase to 977,000 acres and none would be restored to shrublands. Periodic treatment of non-native perennial grasslands to reduce shrubs would maintain grassland group habitat in the short and long terms. The loss of small islands of sagebrush steppe within the grassland would be partially offset by increasing shrubs in the Native Grassland VSG. Increases in shrubs in native grassland would primarily occur through natural recovery in native grassland areas. Long term, this would maintain or result in negligible increases in big game winter range and sagebrush steppe habitat.

Little riparian group habitat would be actively restored in Alternative II generally maintaining the current riparian condition. Riparian habitat currently at PFC would be maintained at PFC (85 miles). Approximately 137 miles of riparian areas would move toward PFC over time. Although objective RI-I-O-1 indicates no additional miles of riparian areas reach PFC, riparian areas within reference areas should attain PFC and some other riparian areas would likely reach PFC over the life of the plan. Habitat for riparian group wildlife would gradually improve in quality but improvements would be minor to negligible at the planning area scale. Beaver would not be transplanted, slowing or precluding the establishment of ponds and willows used by riparian group wildlife.

Impacts from Management Specific to Alternative III

Shrubland would increase from approximately 366,000 to 566,000 acres. Restoration of the Native Shrubland VSG in VMA D for sage-grouse would also increase big game winter range. The majority of the restored area would be sagebrush steppe habitat. However, lesser amount of mountain mahogany/mountain shrub habitat would be restored. Sagebrush steppe group habitat would increase and become more continuous linking some islands of habitat. The increase in shrubland habitat would reduce the amount of grassland habitat in the long term.

Impacts of the shifting annual grassland to non-native plant communities would be the similar to those discussed for Alternative I.

Improving 98 miles of riparian areas to PFC would improve riparian group habitat on a total of 183 miles of perennial streams. Improvement to PFC would extend and connect riparian areas currently at PFC making riparian group habitat more continuous in some areas. Active restoration and beaver re-introductions would more rapidly improve some components of riparian group habitat benefitting waterfowl, amphibians, and other wildlife species.

Impacts from Management Specific to Alternative IV

Big game winter range in VMA D and VMA C would be a focus of restoration. Alternative IV would actively increase shrubland from 366,000 to 948,000 acres in the long term. The majority of the restoration would be in sagebrush steppe with substantially less in mountain mahogany/mountain shrub habitat. Restoration would enlarge existing shrubland habitat and establish corridors of sagebrush between larger shrub islands in the long term. Initially there would not be a change in grassland group habitat. Grassland group habitat would decrease by 581,000 acres in the long term. Planting forbs in areas where they are presently limited would enhance habitat wildlife by improving habitat quality and cover in all group habitats. In general, treatments aimed at converting annual grassland to other grassland or shrubland habitat could improve habitat for grassland group wildlife.

The conversion of annual grassland to perennial grassland is expected to improve habitat quality for wildlife in the grassland group in the treated areas. Grassland group habitat would not initially change, but in the long term, grassland habitat patches would decrease and the distance between grassland habitats would increase.

Alternative IV would result in the same number of miles attaining PFC as described in Alternative III. Alternative IV would also allow for active restoration and beaver re-introductions like Alternative I with similar effects.

Impacts from Management Specific to Alternative V

Vegetation treatments in Alternative V would incorporate more natural recovery processes than other alternatives. Shrub reestablishment would occur over a longer period of time due to a lack of shrub seed sources in parts of the planning area. Limited active shrub reestablishment would occur in both native grassland and non-native perennial grassland. A total of 804,000 acres of shrubland would be present in the planning area. Grassland habitat was projected to decline by 437,000 acres. Using only native plant species for restoration may result in some additional vegetation used by local wildlife, regardless of group. Limiting restoration to native species is expected to reduce the amount of acres treated in part due to plant material costs and availability. Short-term effects of establishing sagebrush steppe and mountain mahogany/mountain shrub would be minor at the local scale and negligible at the planning area scale. In the long term, habitat change would be moderate to major at the local scale and moderate at the planning area scale. Alternative V prohibits use of herbicides to treat annual grasslands which may reduce the likelihood of establishing habitat for sagebrush steppe group in some areas. In the short term, potential impacts to herbaceous cover, arthropod prey base, and potential sub lethal impacts to wildlife would be avoided.

Alternative V would result in the same number of miles of riparian habitat that would reach PFC as was described in Alternatives III and IV. Riparian habitat categorized as functioning-at-risk or functioning-at-risk downward trend would be actively restored, reducing the distance between similar patches of habitat for riparian group wildlife. Because beaver would not be re-introduced, the riparian habitat would recover more slowly than in Alternatives I, III, and IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would actively increase shrubland from 366,000 to 830,000 acres. Planting forbs in areas where they are presently limited would also enhance habitat for big game and other wildlife by improving habitat quality. The effects on sagebrush steppe and mountain mahogany/mountain shrub habitats would be similar to those described for Alternative I. In the long term, patches of sagebrush steppe habitat would increase, reducing the distances between patches of sagebrush steppe and mountain shrub/mountain mahogany habitats.

Alternative VI would result in the same number of miles that would reach PFC as was described in Alternatives III, IV, and V. Riparian habitat patch size and habitat structure and function (e.g., willows, trees, forbs, and sedges) would be improved long term. The effects of re-introducing beaver would be the same as described in Alternative I. Straw bales or gabions could be used in some instances to restore the upper portion of some watersheds where the channel has down cut with the same impacts as Alternative I. Active restoration is expected to improve riparian habitat rapidly.

Impacts from Wildland Fire Ecology and Management Actions

Within the planning area, wildland fire can rapidly alter habitat over large areas (greater than 10,000 acres) in a short time (hours). Fire suppression activities (e.g., back burns, dozer lines, or retardant drops) may adversely affect habitat for several years; however, these actions limit wildland fire size in many cases. The use of vehicles, heavy equipment (e.g. heavy engines, dozers, etc.), and retardant during wildland fire suppression may directly affect some wildlife or damage their habitat, regardless of group. Mortality to individual wildlife (ground squirrels or other burrowing animals) may result from back burns or fire line construction. Effects of these activities are minor at the local scale and negligible at the planning area scale, both short and long term. To the extent suppression actions keep wildland fires from burning larger acres of habitat, suppression activities reduce wildland fire impacts to the adjacent unburned habitats and limit converting sagebrush steppe, mountain mahogany/mountain shrub group habitats, or big game winter range to grassland.

Fuel breaks may hinder or stop wildland fire spread. In some cases, fuel breaks contribute to habitat fragmentation by converting shrubland habitats to grassland habitat. Impacts of fuels treatments to reduce annual grasslands (drill seeding) were addressed under *Impacts from Vegetation Communities Actions*; these impacts are not discussed further in this section to avoid repetition.

Mowing fuel breaks to reduce fuel loads may destroy some songbird nests particularly if done in the late spring. Because most songbird birds nest two or more times in a season, the majority of songbirds with damaged nests either would have nested prior to treatment or would be able to nest again. If mowing was conducted in the early summer, renesting would be unlikely. However, most songbirds would have already produced and fledged a clutch of eggs. Disturbance associated with mowing may temporarily displace some wildlife from the site in the short term. Impacts of this activity would be minor at the local scale in the short term and negligible at the planning area scale short and long term.

Targeted grazing is addressed in this section because it would most likely be used to reduce fuel loads in specific areas. Targeted grazing was recommended for use as part of an integrated management strategy to help control some noxious weeds and invasive plants (Frost et al., 2008). Targeted grazing as part of fuel breaks would likely focus on reducing fuel loads in linear strips along roads or fences in specific areas. Herders, water hauling, additional supplements, or temporary fencing would be used to keep the livestock restricted to the treatment area. Grazing levels would likely be intensive (greater than 70%) in order to meet treatment objectives. The effects of targeted grazing to wildlife and wildlife habitat have been minimally studied. The timing of targeted grazing, frequently during the bolt stage of noxious weeds, overlaps the nesting period of many birds. Concentrated herds of goats or sheep restricted to specific areas could result in elevated trampling of ground nests or dislodge some eggs or nests in low shrubs. Early in the breeding season birds which lose or abandon nests are likely to re-nest. However, re-nesting is less likely later in the breeding season (late June). Impacts of trampling on rodent burrows and the mammals and reptiles using burrows are unknown. In sandier soils, burrows would more likely be collapsed by trampling, potentially harming the species inside. Burrow collapse in loamy soils would be less than in sandy soils since the texture is more resistant to collapse. Human disturbance (i.e., herders, dogs, water hauling) associated with targeted grazing may also displace some wildlife from the adjoining areas.

Temporary fences are frequently constructed following wildland fire to protect burned areas, new treatment areas, restoration projects, and allow continued use of unburned areas. Temporary fences may also be used to facilitate targeted grazing for fuels reduction. Temporary fences can be a source of wildlife mortality and, depending on their placement, further fragment habitat. Temporary fence construction may also damage shrubs in close proximity to the fence and increase livestock trailing along the fence. Temporary fence construction could occur year round.

The following indicator was used to analyze the impacts of Wildland Fire Ecology and Management actions on wildlife habitat:

- Acres with management emphasis (critical suppression areas, priorities and infrastructure).

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, the entire planning area was categorized as full suppression which includes all habitat for all wildlife groups on BLM-managed public lands (1,371,000 acres). National policy mandates wildland fires in the wildland urban interface (WUI) have the highest suppression priority. Idaho BLM State policy elevated the suppression priority of sage-grouse habitat to second following the WUI. BLM fire crews also respond to wildland fires on private, Idaho Department of Lands, Department of Defense property within the planning area. The current trend in wildland fire would continue under management of the No Action Alternative. Sagebrush steppe and mountain mahogany/mountain shrub habitats would continue to be reduced in both the short and long term. Wildland fire would burn in canyonland habitat, increasing the prevalence of invasive plants and reducing habitat quality for wildlife in the canyonland group.

The 1987Jarbidge RMP directed that irregular buffer strips with fire resistant seed mixes in areas with a high frequency of wildland fires be established. A fire rehabilitation and green strip (fuel breaks) plan was developed and partially implemented following the 1987Jarbidge RMP. Unspecified miles of 300 foot wide green strips were installed along some roads and fences which converted primarily areas from sagebrush steppe to crested wheatgrass in order to connect non-native perennial grass seedings and reduce wildland fire size. Near roads the green strip was arranged so the unvegetated road surface divided the green strip increase the chance of stopping wildland fires. Periodically some of the green strips were mowed to reduce woody and herbaceous fuel loads. For the most part larger wildland fires burned through the green strips in the summer and early fall.

Emergency stabilization and burned area rehabilitation (ES&BAR) policy has increased the emphasis on the use of native cultivars being seeded, but allows seeding of non-native grass and forbs, and seeding native shrubs. In the short term, planting grasses and forbs increases residual herbaceous height. Seeding or planting shrubs increases shrub cover in treated areas improving habitat for sagebrush steppe and mountain mahogany/mountain shrub wildlife groups in the long term.

Temporary fences installed following wildland fires as part of ES&BAR can a source of mortality to birds. To reduce potential mortality portions of temporary fences would continue to be marked with vinyl strips to make them more visible to wildlife. A let-down style fence would also be constructed to minimize the likelihood wildlife collisions when appropriate. Temporary fences would result in a short-term increase in infrastructure density at the local scale. When traversing unburned sagebrush steppe or mountain mahogany/mountain shrub habitats, some shrubs in are damaged or killed during construction, maintenance, and removal of temporary fences.

Impacts from Management Specific to Alternative I

Critical suppression areas in Alternative I total around 491,000 acres. The following amounts of group habitat lie within critical suppression areas: aspen 600 acres, canyonland 36,000 acres, grassland 156,000 acres, mountain mahogany/mountain shrub 10,000 acres, sagebrush steppe 331,000 acres. Critical suppression areas overlap more than 200 miles of riparian areas. Critical suppression in these group habitats overlap 372,000 of big game winter range. Sagebrush steppe, mountain mahogany/mountain shrub, canyonland, and aspen group habitats within the critical suppression areas are more likely to be maintained over the life of the plan compared to the same group habitats outside the critical suppression areas. The amount of grassland group habitat may increase over time, particularly outside the critical suppression areas.

Approximately 300 miles of 300-foot wide fuel vegetated breaks would be created in Alternative I (11,000 acres total). Fuel breaks would be configured to follow existing disturbance corridors (i.e., roads, power lines) reducing habitat fragmentation effects. Fuel breaks in grassland habitat configured to protect sagebrush steppe, canyonland, or riparian habitats may provide limited protection to wildlife in those groups from future wildland fires. Vegetated fuel breaks would function long term as habitat for grassland group wildlife. The impact of vegetated fuel breaks is considered negligible at the planning area scale because they occupy less than 1% of the planning area.

Management actions in Alternative I indicate other infrastructure (new routes, improved stream crossing, improved water availability – hydrants, water storage tanks or ponds, and new pipelines) may be installed. Disturbance associated with new infrastructure includes initial construction or installation, periodic maintenance and use would temporarily displace some wildlife. Improved access (water crossings, new routes, or upgraded routes) would likely result in additional use and displacement of some wildlife and occasionally wildlife mortality. Mortality would generally be associated with bird collisions with vehicles or vehicle tires running over reptiles and small mammals. Impacts would be localized and negligible in the short and long term at the planning area scale.

Adding a guard station would increase human disturbance at the site during construction. During wildland fire season, human disturbance would also be increased at the site potentially displacing some wildlife. Adverse impacts (displacement) to wildlife of a guard station would be minor at the local scale in the short and long term. Reduced response time to wildland fires would reduce the amount of habitat burned for all wildlife groups. Long term, this would be beneficial for the sagebrush steppe, mountain mahogany, riparian and aspen group habitats at the planning area scale.

Impacts from Management Specific to Alternative II

Critical suppression areas total about 170,000 acres in Alternative II. Less than 90 miles of riparian areas are in critical suppression areas. About 74,000 acres of big game winter range lies within the critical suppression areas.

About 350 miles of 300 foot wide of vegetated fuel breaks would be created totaling about 13,000 acres. The 13,000 acres of fuel breaks are just under 1% of the planning area which would function as grassland group habitat. Long-term effects are considered negligible at the planning area scale in the short and long term. Impacts from other infrastructure would be the same as described in Alternative I.

Impacts from Management Specific to Alternative III

Critical suppression areas total about 476,000 acres in Alternative III. Approximately 170 miles of riparian areas lie within the critical suppression areas. About 357,000 acres of big game winter range lies within critical suppression areas. Habitats in these areas have a somewhat greater chance being maintained over the long term compared to areas outside the critical suppression area.

Approximately 700 miles of 500-foot wide fuel breaks would be created in Alternative III. Approximately 400 (25,000 acres) miles of fuel breaks would be vegetated and seeded primarily with native and non-native fire tolerant species.

Another approximately 300 miles (19,000 acres) of unvegetated fuel breaks would be installed. The unvegetated fuel breaks are expected to increase habitat fragmentation wherever installed. Unvegetated fuel breaks would require periodic spraying or disking to prevent vegetation from establishing. The associated disturbance with treatments would temporarily displace some wildlife species. Unvegetated fuel breaks have limited habitat value because they do not provide cover or food for wildlife. Although the bare fuel breaks may be used by mammals or birds for dust baths, exposed soils associated with badger or ground squirrel holes, bare areas around ant mounds or slickspots are available. Dispersal and recolonization (Dramstad et al., 1996) would potentially be reduced for some small mammals and reptiles due to the wide unvegetated area acting as a barrier to movements. Birds and mid-sized or larger mammals (badgers, coyotes, mule deer, pronghorn) could easily cross the unvegetated area. Unvegetated fuel breaks would have the best chance of protecting wildlife habitat from large wildland fires, however, burning tumbleweeds or embers pushed by the wind could still cross the fuel break.

Alternative III had the broadest array of potential wildland fire suppression/fuels infrastructure. Impacts would include disturbance resulting in temporary displacement and occasional mortality of some wildlife.

Impacts from Management Specific to Alternative IV

Alternative IV-A would have 592,000 acres of group habitats within critical suppression areas. Alternative IV-B would have 550,000 acres identified as critical suppression areas. There are about 250 miles of riparian areas in critical suppression areas in both Alternatives IV-A and IV-B. About 475,000 acres and

433,000 acres of big game habitat are present in the critical suppression areas in Alternatives IV-A and IV-B, respectively. The higher priority for suppression is expected to minimize habitat alteration and fragmentation due to wildland fire.

The effects of the construction and maintenance of 300 miles of 300-foot wide vegetated fuel breaks (11,000 acres) and other infrastructure would be the same as Alternative I.

Impacts from Management Specific to Alternative V

Over 1,000,000 acres of wildlife group habitat, 870,000 acres of big game winter range, and 300 miles of riparian areas are identified as critical suppression. The large size of the critical suppression areas reduces the value of identifying priorities for suppression making suppression more difficult.

Alternative V calls for the installation and maintenance of 200 miles of 300-foot wide (7,000 acres) fuel breaks. Impacts would be similar to but reduced compared to Alternative I. Alternative V restricts types of potential wildland fire suppression/fuels infrastructure. Because no new routes, helispots, airstrips, or guard stations would be constructed loss of habitat and increases in human disturbance to wildlife or group habitats from these types of infrastructure would not occur. Improved access of some routes would help reduce wildland fire size to some extent. Alternative V also prohibits temporary fencing which eliminates damage to habitat and precludes occasional short-term wildlife mortality from fence collisions.

Impacts from Management Specific to Alternative VI (Proposed RMP)

A total of 597,000 acres were identified for critical suppression in Alternative VI. About 300 miles of 300 foot wide fuel breaks would be installed (11,000 acres). Impacts of the fuel breaks and other infrastructure would be similar to Alternative I. Targeted grazing would be used to alter fuel loads in specific areas. Impacts of targeted grazing to wildlife are addressed in Alternative I.

Impacts from Livestock Grazing Actions

Livestock grazing management activities may change wildlife use of habitat through displacement (Kie, 1996; Loft et al., 1993; Loft et al., 1991; Stewart et al., 2002), human disturbance (e.g., riders and dogs moving or herding livestock, placing salt or supplements, monitoring livestock, or maintaining infrastructure), and alteration of habitat quality or structure (Loft et al., 1987).

Livestock grazing reduces seasonally herbaceous cover (DeLong et al., 1995; Loft et al., 1987; Medin and Clary, 1989) and may influence plant species composition and abundance in riparian areas (Dobkin et al., 1998) and uplands (Reynolds and Trost, 1980). The degree of impact is dependent on historic grazing, plant species, stocking rate, season of use, use levels, and other management practices. In general as the number of animal unit months (AUMs) increase, the amount of residual herbaceous cover would be reduced because of increased consumption and trampling by livestock. The change in residual cover from grazing is not uniform (Connelly et al., 2004) across the landscape. Several factors influence livestock distribution and subsequent grazing including topography, time of year, number and kind of livestock, distance from water, and use of supplements (Holechek et al., 1998). Sites on steeper slopes and farther away from water typically receive less use than level areas near water. During the fall, winter, and spring livestock typically forage farther from water than during the summer. Herding and supplements can be used to decrease use near water and increase use at infrequently grazed sites.

Annually herbaceous height is influenced by changes in precipitation and temperature as well as plant species. Grasses such as Sandberg bluegrass have short basal leaves and few leaves on the culm, whereas bluebunch wheatgrass has taller basal leaves and more leaves extending upward on the culm. Grazing on individual plants and across the pasture is typically uneven. At lower use levels uniformly grazed individual plants are fewer and mixed with partially grazed and ungrazed plants. As use levels increase, more individual plants are more uniformly grazed and fewer plants are partially grazed and ungrazed (Ralphs et al., 1990). Grasses under shrubs maybe taller and benefit from physical protection or shade (Huber-Sannwald and Pyke, 2005), soil moisture recharge (Ryel et al., 2003), or hydraulic lift (Ryel et al., 2002).

The impacts, both positive and negative, of livestock grazing on wildlife are contentious (Connelly et al., 2004). Nest success for a number of ground-nesting birds is influenced by residual cover. As a general rule, the less cover, the lower the nesting success for most species due to predation, nest parasitism, and climatic factors (Connelly et al., 2004; Dechant et al., 2003a; Dechant et al., 2003b; Swanson, 1998). Nesting cover requirements for ground-nesting songbirds have had limited research in Idaho and sagebrush steppe habitats in general. Irrespective of grazing, Robel and others (2003) noted parental bird behavior may attract brown-headed cowbirds and avian predators to nests; whereas, odor and thermal differences potentially attract snakes and mammalian nest predators. Research generally indicates that a relatively small portion of bird nests on the ground are actually trampled by livestock (Renfrew and Ribic, 2003), but trampling may be additive to other forms of nest failure (Renfrew et al., 2005). Livestock are known to flush birds from nests (Coates, 2007), which could increase detection of nests by avian predators or cowbirds. Reducing cover at the nest site may alter the micro-climate at the nest allowing odors travel farther and increasing predation by mammals. In New Mexico, brown-headed cowbirds travel roughly two to six miles from pastures being grazed by livestock to parasitize nests in ungrazed areas (Goguen and Mathews, 2001, Chace et al., 2005). Livestock grazing outside the nesting season would not impact nesting songbirds. In Washington grazed sites with sandier soils are more likely to have burrows collapsed by livestock than pastures with loamy soils (Holmes et al., 2003).

Mule deer (Loft et al., 1991) and elk (Stewart et al., 2002) are known to be displaced to some degree by livestock. Typically, big game return to previously occupied areas after livestock removal (Stewart et al., 2002). During the winter mule deer (Mackie et al., 2003), pronghorn (Byers, 2003), and elk (Geist, 1982) have increased energy requirements for thermoregulation and movement. Big game species minimize energy expenditure during the winter to increase survival (Geist, 1982). Impacts from displacement are potentially greater during the winter. Big game may be displaced to lesser quality habitat or areas that have higher predation (Geist, 1982). Mule deer displaced from winter range during the winter may have increased energy requirements or incur higher mortality. In Idaho, mortality for fawns over winter is variable, but about twice that of doe mule deer (Unsworth et al., 1999), with malnutrition the primary cause of death in some years. Snow 15 to 18 inches deep can preclude use by mule deer (Gilbert et al., 1970). Increases in energy use for movement (Parker et al., 1984), thermoregulation, and basic metabolic function during the winter are factors in the difference in mortality between adult female mule deer and fawns (Hobbs, 1989).

A number of research studies have shown the nutritional quality of browse (Alpe et al., 1999) and grass (Pitt, 1986; Wambolt and Payne, 1986; Westenskow-Wall et al., 1994) was improved for a period of time by livestock grazing on winter range. Periodic (once every three to five years) moderate spring grazing by livestock in big game winter range was reported to promote the establishment of desired shrubs for browse (Austin, 2000), by reducing grass competition to shrub seedlings and increasing shrub canopy (Ganskopp et al., 1999).

Range infrastructure can influence wildlife habitat (Connelly et al., 2004; Rowland et al., 2000), and wildlife mortality (Beck and Mitchell, 2000; Connelly et al., 2004; Harrington and Conover, 2006). Stock ponds and water storage reservoirs provide water in areas that historically lacked water for amphibians, bats, coyotes, songbirds, waterfowl (O'Brien et al., 2006), and big game. Livestock waters may influence distribution and possibly abundance of big game, upland game, and other wildlife, such as bats (Rabe and Rosenstock, 2005) in arid environments. Wildlife readily use free water from artificial sources in the summer when present (Cutler and Morrison, 1998; Deblinger and Alldredge, 1991; Howe and Flake, 1988; Lynn et al., 2006). Fenced water storage reservoirs and ponds provide habitat for waterfowl and shorebird nesting in part due to emergent and upland vegetation within the fenced area. Because troughs are primarily filled when livestock are present, troughs may be are dry during the summer if livestock are absent. Summer is usually when water is potentially more limiting for some wildlife species.

West Nile virus is carried by infected mosquitoes in several species (*Culex tarsalis, C. pipiens, Aedes vexans, Coquillettidia perturbans)* (Marra et al., 2004). These species are found in southern Idaho (Ada County Mosquito Abatement District, 2007). West Nile virus can be lethal to crows, eagles, gulls, hawks, jays, owls, ravens, sage-grouse, and a variety of songbirds (Marra et al., 2004). Mosquitoes in the genus *Culex* are the main insect carriers of West Nile virus for transmitting the virus in birds (Marra et al., 2004).

Although mosquito species commonly occur in permanent or semi-permanent ponds, some species can also hatch in small ephemeral pools and water in animal tracks (Ada County Mosquito Abatement District, 2007). Mosquitoes breeding in ephemeral water usually have a rapid life cycle, maturing in as few as seven days (Ada County Mosquito Abatement District, 2007). Areas where organic material is concentrated in stagnant water provide ideal breeding conditions for *Culex*, *Aedes,* and other mosquitoes (Marra et al., 2004). Although there has been concern that livestock waters may provide breeding habitat for mosquitoes carrying West Nile virus (FWS, 2008), this has not been researched to date.

The following indicators were used to analyze the impacts of Livestock Grazing actions on wildlife habitat:

- Change in upland acres of wildlife group habitats,
- Miles of riparian areas meeting or planned to be restored and managed to achieve proper functioning condition (PFC),
- Acres with management emphasis (available or unavailable for grazing, associated infrastructure and human disturbance), and
- Relative change in the amount of cover for wildlife.

Impacts from Management Specific to the No Action Alternative

About 1,412,000 acres are available for livestock grazing. Within the majority of the area new projects (infrastructure) to improve livestock distribution would be expected to continue to a degree. Projects would be analyzed in detail when proposed. Fences, pipelines, ponds, water troughs, and routes would increase at the local scale. Depending on the project habitat could be reduced or divided at the local scale. The Jarbidge RMP indicates vegetative improvements would be maintained by removing the shrubs which have invaded seedings. Under this direction grassland group habitats would be maintained at 969,000 acres in the short and long terms. Sagebrush steppe (314,000 acres) and mountain mahogany/mountain shrub (16,000 acres) group habitats would not increase and would likely decrease following future wildland fires in the short and long term.

Under current management 85 miles of riparian areas have met PFC. Continued implementation of the 1987 Jarbidge RMP to fence Bear, Cedar, Cherry, parts of Clover, Rocky Canyon, Shack and Spring Creeks would to some extent expand and improve riparian group habitat in these creeks.

In the areas available to livestock grazing, the No Action Alternative provides no direction regarding placement or minimizing disturbance of new infrastructure by locating it near existing disturbed areas. Depending on location, new fences or pipelines would increase infrastructure and route density, split habitats and in a few cases (corrals) reduce habitat at the local scale. The majority of the new infrastructure is expected to be constructed in grassland and sagebrush steppe group habitats. A limited amount of new fencing may be installed within canyons which also cross riparian areas (see streams listed above). New fences associated with the protection of Cedar, Rocky Canyon, and Shack Creeks could pass through some small patches of aspen and mountain mahogany/mountain shrub habitats depending on configuration. Fences in sagebrush steppe, mountain mahogany/mountain shrub, riparian, or aspen habitats may result in some physical damage to the vegetation near the fence from vehicles or trailing livestock. Wildlife collisions with fences remain a source of mortality (Stevens et al., 2012). Marking fences would reduce wildlife fence collisions (Stevens et al., 2012). Fences control livestock movements allowing a large number of pastures to remain ungrazed during nesting which mitigates impacts to nesting birds at the planning area scale in the short and long terms.

Human disturbance associated livestock grazing includes new project construction, maintenance of existing livestock infrastructure, moving livestock between pastures and allotments, placing and removing salt/supplements, and periodic checks of livestock and livestock waters. Routes associated with infrastructure construction and maintenance often provide access into areas that previously lacked access. The routes are used not only by livestock operators, but are seasonally used by recreationists. These human disturbances are sporadic, short in duration, and localized. Some wildlife would be temporarily displaced but most would return to the area sometime after the disturbance ceased.

Water stored in reservoirs and troughs provide water to wildlife in areas which previously lacked water. Within the planning area the majority of troughs only contain water when livestock are present. Once livestock leave a pasture water to the troughs is turned off and the remaining water evaporates reducing the local water availability for wildlife. Pronghorn or mule deer would likely shift or may abandon home range in response to reduced water. Small mammals and most birds would likely obtain sufficient moisture in their diets and not shift home range. Bats can travel substantial distances for water or to forage, therefore a reduction in upland surface water would not be expected to change bat distribution. Water stored in reservoirs remains for a longer time and provides local wildlife a reliable water source resulting in few changes to wildlife home ranges or distribution.

Approximately 200,000 AUMs of grazing are presently authorized. The highest number of AUMs allowed under the No Action Alternative would be about 260,000 AUMs or 30% increase from current levels which would reduce residual cover for wildlife. Livestock use in grassland creates mosaics of short and tall grass habitats which meet requirements of a variety of birds which nest or forage in these areas. The additional AUMs would decrease vegetation heights that provide cover for wildlife and somewhat increase shorter grass areas used by ground foraging bird species. Although grazing alters herbaceous cover which may influence nest success, Fondell and Ball (2004) observed that the negative effects of grazing due to the change in nest concealment were minimal and influenced by other factors such as nest site selection, nest density, or predator abundance. Although a number of pastures are grazed during nesting, wintering, or other important seasonal periods, many pastures are not, reducing the effects at the planning area scale.

A limited amount of temporary non-renewable (TNR) permits would continue to be issued in allotments with a history of receiving TNR permits. The issuance of TNR permits locally reduces residual cover for wildlife. The majority of TNR permits are issued outside big game winter range which minimizes displacement of wintering mule deer and pronghorn.

Table 4-113. Wildlife Group Habitat and Big Game Winter Range in Areas Available for Livestock Grazing by Alternative

Habitat Group	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Aspen (acres)	2,400	2,300	2,300	2,300	2,400		1,200	2,300
Canyonland (acres)	17,000	14,000	15,000	15,000	14,000		10,000	14,000
Duneland (acres)	700	700	700	700	700		700	700
Grassland (acres)	969,000	952,000	967,000	966,000	914,000	934,000	806,000	966,000
Mountain Mahogany/ Mountain Shrub (acres)	16,000	16,000	16,000	16,000	15,000		7,000	16,000
Sagebrush Steppe (acres)	314,000	311,000	313,000	313,000	284,000	295,000	244,000	313,000
Total	**1,320,000**	**1,297,000**	**1,314,000**	**1,313,000**	**1,230,000**	**1,261,000**	**1,069,000**	**1,312,000**
Riparian (miles)	145	117	132	132	117		77	121
Big Game Winter Range (acres)	873,000	860,000	869,000	868,000	788,000	819,000	691,000	867,000

Impacts from Management Common to All Action Alternatives

Drought management guidelines are expected to minimize effects of livestock grazing during drought on plant communities and wildlife. Drought during a single year can reduce forage quality and abundance,

hiding cover, and forage availability for the coming winter. Mule deer and pronghorn winter mortality can be elevated following severe drought (Singer et al., 1989). Drought reduces the survival of ground squirrels (Van Horne et al., 1998; Steenhof et al., 2006), and some birds (George et al., 1992). Drought not only reduces vegetation height, but can also alter the insect prey base used by birds, lizards, and some small mammals (George et al., 1992) or bats. The drought guidelines reduce but do not ensure adequate residual herbaceous height for some wildlife, primarily some ground nesting birds. Table 4-113 lists the amount of wildlife groups for BLM lands in areas available for livestock grazing.

Impacts from Management Specific to Alternative I

Approximately 1,389,000 acres would be available to livestock grazing. Alternative I would allow 179,000 to 245,000 AUMs at full implementation. New infrastructure would include approximately 170 miles of new fence for reference areas. The amount of fence for reference areas is likely high because some existing fence could be used to form part of the reference area boundary where possible. Additional fences, pipelines, and water troughs would likely be developed to improve livestock distribution in some allotments. An unknown amount of new fence would be used to protect resources. The majority of new infrastructure would be developed in grassland habitat; however, some projects would also be in sagebrush steppe and mountain mahogany/mountain shrub group habitats. Some new routes would form in conjunction with construction and maintenance of fences and pipelines projects. Fence density and pipeline density would increase minor to moderately at the local scale and be negligible to minor at the planning area scale. Reductions in the amount grassland, sagebrush steppe and other wildlife group habitats in the areas available to livestock grazing are a result of the fenced reference areas rather than shift in habitats. Refer to the *Impacts from Vegetation Actions* section for shifts in grassland and shrubland communities.

Improvement of another 60 miles of riparian areas to PFC would increase and improve habitat for the riparian group. Recovery of riparian reference areas not at PFC would be more rapid due to livestock exclusion (Dobkin et al., 1998). However, recovery of riparian group habitat outside reference would be slowed to some degree by continued grazing of the riparian areas.

The relative amount of cover for wildlife would be decline from the present amount at full implementation. At 30% to 40% utilization levels residual grass heights (upright stems and leaves) would average 3.0 to 4.0 inches for Idaho fescue (22-inch ungrazed height), 4.5 to 6.5 inches for bluebunch wheatgrass (22-inch ungrazed height), and 4.5 to 6.0 inches for Sandberg bluegrass (22-inch ungrazed height) depending on the dominant grass species. Non-native perennial pastures would have a 40% to 50% use level. Crested wheatgrass (22-inch ungrazed height) residual grass height would vary between 5.0 to 6.5 inches. Residual grass heights at the different utilization levels would not be uniform across pastures or allotments. Some grasses may be ungrazed or grazed on one side while an adjacent grass is grazed to a more even height. Residual herbaceous grass from the previous non-drought year could exceed the current year's residual height during a drought year. Because cattle tend to remain near water in the summer residual grass heights are usually short near water sources and increases with distance from water (Vallentine, 2001). Cooler temperatures and increased precipitation in the spring, fall, and winter allow livestock to disperse away from water sources. New areas of short vegetation would be created at new trough locations.

Periodically, grazing at a 70% utilization level would be allowed in non-native perennial grass seedings to reduce wolf plants (Ganskopp et al., 1992). Seventy percent use of crested wheatgrass 22 inches tall would provide an average residual height of less than 3 inches, reducing cover for wildlife. Less variation in grass height is expected in pastures grazed to 70% due to more uniform grazing of most plants over more of the pasture. Additionally, residual herbaceous cover from the previous year(s) would be reduced. It could take more than two or more growing seasons for grass to provide the same structure (height, density of stems and overhanging leaves) after 70% use occurs for some grassland group birds. Nest success for ground-nesting birds may temporarily decline (one nesting season) due to the decreased cover during the nesting season after 70% utilization. In pastures with sandy soils 70% utilization would likely contribute to the collapse of rodent burrows. At the planning area scale, impacts to wildlife would be minor at the local scale and negligible at the planning area scale because other pastures would likely receive less use so 70% use could be achieved in targeted pastures.

Herbaceous cover would likely be a little more in pastures which contain 50% big game winter range because TNR permits would not be issued. Natural weathering and snow would still reduce a portion of the herbaceous height and cover. However, TNR permits could be issued on over 700,000 acres where big game winter range constitutes less than 50% of the pasture acreage reducing residual cover for wildlife locally. Depending on the timing of grazing, herbaceous cover in these pastures would be reduced. The amount of TNR permits are expected to vary between years, but the use levels would be similar. The issuance of TNR permits on big game winter range during a severe winter could displace or increase movements of wintering mule deer or pronghorn elevating winter mortality.

Impacts from Management Specific to Alternative II

About 1,408,000 acres would be available for livestock grazing. The additional (362,000 to 440,000) AUMs would likely result in more pastures being divided and additional pipelines and water troughs installed to enhance livestock management and distribution. Although there would be a small decrease in group habitats in areas available for grazing, this would be due to the fenced reference areas. To maintain the 440,000 AUMs long term, grassland habitat (967,000 acres) would be maintained precluding substantial increases in sagebrush steppe group or mountain mahogany/mountain shrub habitats. Approximately 62 miles of new fence would be constructed to protect reference areas. Although less new fence is identified to protect reference areas, new fence to facilitate livestock management would be expected to offset or exceed the reduced miles reference area fence. Wildlife collisions with fences would increase mortality on some species locally. Increased mortality would be minor to negligible at the local scale and negligible at the planning area scale.

Alternative II would have more miles of pipeline to enhance livestock distribution. Impact areas would expand around existing troughs and form around new trough locations. Pipelines and troughs would reduce habitat locally and split habitat, primarily for grassland and sagebrush steppe groups. The amount of infrastructure would result in moderate effects at the local scale (short and long term) and minor effects at the planning area scale (short and long term).

Recovery of riparian habitat in reference areas to PFC would occur faster compared to grazed riparian areas in the long term. Although no additional riparian habitat would be expected to achieve PFC, habitat for riparian group wildlife would improve in the long term as riparian areas moved toward PFC.

Grazing at utilization levels of 40% to 50% in native areas (estimate for analysis purposes only) would leave average residual grass heights of 2.5 to a little under 3.0 inches for Idaho fescue, 4.5 to 5.5 inches for bluebunch wheatgrass, and 3.5 to a little under 5.0 inches for Sandberg bluegrass. Grazing crested wheatgrass pastures to 50% to 60% (estimated utilization for analysis purposes) would result in a 3.5 to 5.0 inches average residual vegetation height. The increased use levels would result in more uniform grazing, with fewer partially grazed and ungrazed grasses. Residual grass height would further be reduced by the issuance of TNR permits. During the bird breeding/nesting period, shorter vegetation may increase the risk of nest predation or parasitism due to less cover. Higher utilization coupled with TNR permits would result in a moderate to major increase in acres with less residual herbaceous cover locally. At the landscape scale reduced residual cover would be minor to moderate. Average grass height would be reduced in all group habitats except the canyonland group. Canyonland group habitat is generally protected by steep rocky terrain which would maintain residual grass heights similar to the current condition. More of the Grassland habitat with shorter residual grass height would be more suitable for birds such as the horned lark (Beason, 1995) and long-billed curlew (Dechant et al., 2003c), but less suitable for nesting by species such as the short-eared owl (Dechant et al., 2003a), savannah sparrow (Wheelwright and Rising, 2008), and western meadowlark (Dechant et al., 2003b) that prefer taller vegetation.

All big game winter range in areas open to livestock grazing would not have seasonal restrictions on TNR permits. The time of year (Ganskopp et al., 1999) and snow depth in some areas would likely increase livestock use of browse in years with above normal snow pack. Livestock and associated human disturbance would displace and increase movements for some wintering big game. In severe winters mortality on big game would likely increase due to higher energy expenditures due to cold, snow depth, movements and increased predation.

Impacts from Management Specific to Alternative III

Approximately 1,407,000 acres would be available for livestock grazing. About 85 miles of new fence would also be needed to exclude livestock from reference areas. Additional fences, pipelines and troughs would be constructed to enhance livestock distribution for the additional 276,000 to 348,000 AUMs. Infrastructure would divide habitat and in some instances reduce habitat. Maintaining 348,000 AUMs would reduce the amount of grassland habitat converted to shrublands in the long term. Wildlife collisions with some fence would increase locally. Impacts may be minor to moderate at the local scale and minor at the planning scale in both the short and long term. Changes in amounts of group habitat would be minor to moderate at the local scale and minor at the planning area scale.

Management to improve another 98 miles of riparian habitat to PFC would expand and connect some of the habitat for wildlife in the riparian group in the long term. Riparian habitat within reference areas would improve more rapidly than riparian habitat outside reference areas due to less trampling and grazing.

Cover for wildlife provided by residual native grasses would be the same as in Alternative I with the similar impacts to wildlife. Residual grass heights for non-native perennial grasses would be the same as Alternative II and would have similar impacts.

Additional AUMs may be granted as TNR permits. Estimated utilization levels on key native grass species would be the similar to Alternative I; therefore, impacts are expected to be the similar. Estimated utilization of non-native perennial grasses would be the same as in Alternative II; therefore, those impacts are expected to be the same as described for Alternative II. TNR permits would not be authorized in pastures with more than 50% big game winter range; the effects would be the same as described in Alternative I.

Impacts from Management Specific to Alternative IV

Approximately 1,324,000 acres or 1,355,000 acres would be available for livestock grazing in Alternatives IV-A and IV-B, respectively. Decreases in group habitat available to grazing would be due to reference areas and some Areas of Critical Environmental Concern (ACECs). Refer to the *Impacts from Vegetation Actions* section for shifts in grassland and shrubland communities. An estimated 170 miles of new fence would be constructed to exclude livestock from reference areas. A little additional new fence may be constructed to protect resources (e.g., riparian, cultural) or alter livestock distribution. The increase in new fence would be partially offset by the removal of fence in the Inside Desert area. The amount new infrastructure would be limited in part due to reduced 78,000 to 127,000 AUMs. The lower amount of AUMs reduces the grassland acreage that would be needed to support livestock grazing allowing more upland habitat to be restored to sagebrush steppe and mountain mahogany/mountain shrub group habitats. A reduction in fence density would result in a minor beneficial effect to wildlife at the local scale due to less fence collision risk in the Inside Desert area. Due to the fenced reference areas, fence density would increase overall. Impacts are expected to be minor at the local scale but negligible at the planning area scale in both the short and long term.

The same amount of riparian area would improve to PFC. Since riparian reference areas are larger than Alternative III, more riparian areas would achieve PFC faster than Alternative III. Habitat would improve and connect more rapidly benefitting wildlife in the riparian group in the long term.

Estimated utilization levels of 20% to 30% on grasses in native plant communities and 30% to 40% on grasses in non-native grassland would provide adequate nesting cover most years. The approximate residual grass height for 22 inch tall ungrazed grasses would be 5.0 to 6.0 inches for Sandberg bluegrass, 6.5 to 8.0 inches for bluebunch wheatgrass, and 4.0 to 5.5 inches for Idaho fescue; crested wheatgrass would have 6.5 to 8.5 inches of residual grass height. Because of the lighter use on crested wheatgrass, more grass would retain seed stalks from prior years, increasing cover and structure for wildlife in the grassland group. Because “wolf plant” treatments would not be done, multiple years’ worth of stems would accumulate in crested wheatgrass. The increase in “wolf plants” grassland less suitable for species which prefer short grass heights and favor species which like taller grass heights.

TNR permits would not be authorized in pastures with more than 50% big game winter range; the effects would be the similar as described in Alternative I. TNR permit authorizations would reduce residual herbaceous cover a minor to moderate amount at the local scale.

Impacts from Management Specific to Alternative V

The decrease in wildlife group habitat in areas available to grazing would be due to the large reference areas. Changes from grassland to shrubland were addressed in the *Impacts from Vegetation Actions* section. No new fence would be constructed to exclude livestock because reference areas are pasture sized. On the 1,160,000 acres available for livestock grazing outside reference areas a limited amount of new fence would likely be constructed for resource protection. Unneeded fences or other grazing infrastructure in the pasture sized reference areas would be removed reducing wildlife fence collision mortality at the local scale. Human disturbance associated with livestock grazing would be reduced in the pasture sized reference areas. Changes in wildlife collision with range infrastructure would be negligible at the local scale and planning area scale. The amount of grazing AUMs would have minimal influence on changes to upland wildlife group habitats.

The amount of riparian areas attaining PFC is the same as Alternative III. Riparian group habitat would improve more rapidly in riparian reference areas. The lower amount of AUMs would reduce trampling of riparian areas outside the reference area somewhat increasing the recovery rate of riparian group habitat and increasing riparian habitat.

Alternative V would limit livestock utilization levels to 10% to 20% within the Sagebrush Sea ACEC, 20% to 30% in native plant communities, and 30% to 40% in non-native perennial grasslands in order to achieve resource objectives. AUMs would decrease from 200,000 to 42,000 through 85,000 over the life of the plan. Average residual grass heights for 22-inch tall plants at 10% to 20% would vary from 8.5 to 12.0 inches for Sandberg bluegrass, 8.0 to 10.5 inches for bluebunch wheatgrass, and 5.5 to 8.0 inches for Idaho fescue. Residual grass heights from 20% to 30% utilization on Sandberg bluegrass, Idaho fescue and bluebunch wheatgrass would be the same as in Alternative IV. At 10% to 30% utilization residual grass cover would be adequate for sage-grouse nesting in most years.

Lower AUMs, coupled with the absence of TNR permits would increase residual nesting cover for ground-nesting birds in all groups. Livestock grazing would provide small areas of suitable habitat for those grassland group wildlife that prefer less herbaceous height. Areas with less herbaceous height would generally be relatively close to water sources. Ground squirrels and other native herbivores are expected to provide some localized short grass habitat within and outside reference areas. Grassland species which prefer taller grass would have more suitable habitat over more area.

During severe winters, big game energy expenditures for movements due to displacement or human disturbance associated with winter TNR livestock grazing permits would be eliminated which may somewhat improve survival. Benefits would result in minor to moderate at the local scale in the short term.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Approximately 52 miles of new fence would be constructed to protect reference areas. On the 1,406,000 acres available for livestock grazing new fence would probably be built for resource protection and enhance livestock distribution. The AUM range (186,000 to 279,000) would likely result in some additional new pipeline and water troughs to improve livestock distribution. New fences and other infrastructure would divide and in some cases (water trough sites, routes associated with new pipeline) reduce habitat. New fences would contribute to additional wildlife mortality due to collisions. Marking the top wire of the fences would reduce wildlife mortality (Stevens et al., 2012). Loss or division of habitat would be minor to moderate at the local scale and negligible to minor at the planning scale in both the short and long term.

Fewer and smaller reference areas would increase some of the wildlife group habitat in areas available to livestock grazing. To maintain 279,000 AUMs for livestock some grassland group habitat would be retained (see the *Impacts from Vegetation Actions* section for shifts in grassland and shrubland communities). This would potentially limit restoration of sagebrush steppe in the northern half of the

planning area. The amount of riparian areas attaining PFC is the same as Alternative III with similar effects.

The overall increase in infrastructure would increase the density of fences, pipelines, and routes. Effects of livestock infrastructure and grazing would be similar to the No Action Alternative and Alternative I. Although Alternative VI has somewhat more AUMs, at the planning area scale the difference is negligible. Because of increased AUMs residual herbaceous cover would be slightly reduced compared to the No Action Alternative.

The somewhat higher AUMs would reduce wildlife cover. However the use level are the same as Alternative I and would have the same effects. Authorization of TNR permits would reduce residual grass heights a negligible to moderate amount depending on the amount of TNR permits issued, pasture size, and type of grass species.

TNR permits on big game winter range during the winter would have impacts similar to those described in Alternative II.

Impacts from Recreation Actions

Human disturbance can influence wildlife behavior (Borkowski et al., 2006; Cassirer et al., 1992; Freddy et al., 1986; Miller et al., 1998; Lenth et al., 2008) and habitat use (Cassirer et al., 1992; Ingelfinger and Anderson, 2004; Miller et al., 1998). Boyle and Sampson (1985) summarized the effects of non-consumptive recreation on wildlife to include disturbance, displacement, and damage to habitat. Impacts to wildlife are influenced by time of year, type and duration of disturbance, frequency of disturbance, proximity of humans to wildlife when detected, and other factors (Boyle and Samson, 1985). In Colorado, winter use by hikers and bicyclists on a trail by a riparian area resulted in lower use by raptors compared to control areas without trails (Fletcher et al., 1999). Recreational trail use may displace some songbird species from suitable nesting habitat (Miller et al., 1998); however, a few wildlife species may be attracted to edge habitat created by trails. Hikers with dogs can influence wildlife differently than hikers without dogs (Miller et al., 1998, 2001). Humans approaching on foot can produce a stronger effect on nesting raptors than motorized vehicles (Holmes et al., 1993). Wildlife responses to recreation also differ by wildlife species, number of individuals in a group, and experience from previous human encounters (Boyle and Samson, 1985). For example, mule deer responded to one to three hikers the same as they did to one to three people on mountain bikes, horseback, or on all-terrain vehicles (ATVs) (Wisdom et al., 2004). However elk reacted less to people on horseback compared to hikers, mountain bikers, and ATV riders (Wisdom et al., 2004). Motorized recreation, horse, and human foot traffic can also damage vegetation, compact soils, and increase the spread of noxious weeds or invasive plants, indirectly affecting habitat quality over the long term. Wildlife habituated to human activity appear to have a minor response to recreationists, but in some instances even habituated wildlife many change behavior in response to increased disturbance.

The following indicators were used to analyze the impacts of Recreation actions on wildlife habitat:

- Change in upland acres of wildlife group habitats and
- Acres with management emphasis (Special Recreation Management Areas [SRMAs]).

Impacts from Management Common to All Alternatives

Staging areas required in Special Recreation Permits (SRPs) would be located, to the extent practical, in already disturbed areas or grasslands to avoid damage to shrubland habitats. SRPs that use routes, such as mountain bike races or motorcycle races, would be required to follow existing routes and avoid sagebrush steppe, mountain mahogany, and aspen habitats. Restricting these types of SRPs to existing disturbance corridors minimizes additional reduction or damage to habitat in all groups along the route. By focusing SRPs for motorized use in areas that can withstand periodic intense use, such as grasslands, habitat would be maintained in aspen, canyonland, mountain mahogany/mountain shrub, riparian, and sagebrush steppe habitats. Some wildlife may be displaced temporarily by increased human activity associated with SRPs. From the late spring through early fall, mortality could occur to some reptiles, small mammals, or less frequently to birds if they are struck by vehicles or tires during motorized SRP events.

Although some wildlife mortality would occur, the effects on populations of reptiles, birds, and small mammals would be negligible at the planning area scale.

SRPs would contain stipulations or restrictions including season or time of day constraints to minimize disturbance during important wildlife periods and habitats, as appropriate. When SRP events avoid important wildlife seasons or time of day, impacts of human disturbance are reduced.

Table 4-114 identifies the amount of wildlife group habitat by SRMA. Impacts from recreation SRPs to wildlife or their habitat are dependent on the type of recreation, duration, number of participants, and location.

Table 4-114. Wildlife Group Habitat by Special Recreation Management Area

SRMA	Group Habitat					
	Aspen (Acres)	Canyonland (Acres)	Grassland (Acres)	Mountain Mahogany/ Mountain Shrub (Acres)	Riparian (Miles)	Sagebrush Steppe (Acres)
Balanced Rock	0	70	420	0	1	10
Canyonlands	100	16,000	90,000	100	43	43,000
Deadman/Yahoo (Expanded)	0	0	34,000	0	1	100
Yahoo [A]	0	0	3,000	0	1	300
Jarbidge Foothills	2,500	3,500	29,000	16,000	61	82,000
Jarbidge Forks	0	1,000	100	0	7	200
Little Pilgrim	0	100	100	0	2	100
Salmon Falls Reservoir	0	0	100	0	8	4,000

[A] This SRMA is called Hagerman-Owsley Bridge in the No Action Alternative.

Impacts from Management Specific to the No Action Alternative

Hagerman-Owsley Bridge

The majority of the wildlife habitat in the SRMA is categorized as grassland (3,000 acres); the remaining is sagebrush steppe habitat with an understory dominated by cheatgrass. Cross-country motorized vehicle use has created numerous routes and hill climbs splitting the grassland and the remaining sagebrush steppe habitat reducing habitat patch size. The riparian habitat along Yahoo Creek is dominated by Russian olive. The Russian olive limits motorized vehicle access across Yahoo Creek to three locations within the SRMA. The number of routes would continue to expand further reducing habitat patch size within and adjoining the SRMA.

The Hagerman-Owsley Bridge SRMA (Yahoo) is primarily focused on motorized recreation. New routes would continue to be developed increasing route density and disturbance within and adjoining the SRMA. Trails down steep slopes on both sides of the drainage lead to Yahoo Creek. Some wildlife, primarily small mammals and reptiles, incur mortality from cross-country motorized vehicle use. Due to the relatively small size of the SRMA, impacts to wildlife and habitat are localized and considered negligible at a planning area scale.

Jarbidge Forks

The Jarbidge Forks SRMA has over 1,000 acres of canyonland habitat, with about seven miles of riparian habitat. The riparian area generally has a juniper or cottonwood juniper overstory. Most of the camp sites in the Jarbidge Forks SRMA were developed in or prior to the 1990s. There are few places with room for recreation developments; therefore new infrastructure would not reduce habitat patch size.

Human disturbance in this SRMA, primarily on summer weekends, would be localized to campgrounds and have a negligible impact on the majority of birds, small mammals, or reptiles present. At a riparian area in northern Utah some wildlife species were found in greater numbers in campgrounds whereas

other species avoid campgrounds (Blakesley and Reese, 1988). Magpies, , chipmunks and mice readily forage in campgrounds.

Salmon Falls Creek
Although identified in the 1987 Jarbidge RMP, there are no records of a specific location or infrastructure being installed in this SRMA. A number of routes have been created or altered by fisherman seeking access to the west side of Salmon Falls Creek Reservoir.

Impacts from Management Specific to Alternative I

Balanced Rock
A reduction riparian or canyonland group habitat within the Balanced Rock SRMA would not occur because of limited infrastructure would be installed. Potential infrastructure would likely be modifying the existing hiking trail which runs upstream for Balanced Rock Park. Human disturbance would continue in the Balanced Rock SRMA due to its proximity to local population centers. The trail could be extended in the future, increasing trail density locally. Although human use would likely increase, additional impacts to wildlife in riparian and canyonland groups would be minimal due to topography which limits most human activity to or near the riparian area at the bottom of the canyon. The streambanks are protected by willows restricts use. Birds in the riparian area nesting on the west side of the canyon may occasionally be flushed off nests by fisherman or hikers in the summer. Birds nesting on the east side of the creek would have negligible impacts because of a lack of access. Disturbance impacts to wildlife and habitat would be localized. At the local and planning area scales effects would be negligible in both the short and long term.

Canyonlands
No new routes would be constructed in this SRMA maintaining habitat size. Potential impacts are negligible at the local and planning area scales. Infrastructure associated with recreation would not likely be installed. The focus of the SRMA in this alternative is primitive recreation. The primary expected use in the SRMA would be hunting in the fall. Limited sightseeing occurs infrequently in the summer. Displacement of wildlife due to human disturbance associated with the SRMA would be negligible at the local and planning area scales.

Deadman/Yahoo
Use of the routes would displace some wildlife use from the immediate area. Routes not designated would gradually re-vegetate, increasing habitat grassland in the long term and would offset the creation of new routes. Impacts to wildlife habitat would be minor at the local scale and negligible at the planning area scale.

The focus of the Deadman/Yahoo SRMA would be motorized recreation. Presently there are numerous user created routes and hill climbs. Grassland group habitat covers the majority of the SRMA. Some cross-country motorized vehicle use would be present at designated hill climb sites and open areas connected by designated routes. In a few instances exiting routes would be modified or new routes created which would increase route density locally. New routes would reduce and split grassland habitat. Hill climb and open off-highway vehicle areas would total about 3,000 acres in the western part of the SRMA and 1,000 acres in the eastern part of the SRMA. Designating specific trails and limiting open hill climb areas would minimize future unplanned increases in route density. Noise associated with motorized recreation would displace some wildlife. Occasionally birds near trails may be flushed from nests resulting in some eggs or young being dislodged from the nest. During the late spring through summer some reptiles would be killed after being struck by vehicle tires. Disturbance to wildlife and declines in grassland habitat would be minor at the local scale and negligible at the planning area scale in the long term.

Table 4-115. Wildlife Group Habitat for each Special Recreation Management Area for Alternative I

SRMA	Group Habitat					
	Aspen (Acres)	Canyonland (Acres)	Grassland (Acres)	Mountain Mahogany/ Mountain Shrub (Acres)	Riparian (Miles)	Sagebrush Steppe (Acres)
Balanced Rock	0	100	420	0	1	< 100
Canyonlands	100	16,000	90,000	100	43	43,000
Deadman/Yahoo (Expanded)	0	0	34,000	0	1	100
Yahoo [A]	0	0	3,000	0	1	300
Jarbidge Foothills	2,500	3,500	29,000	16,000	61	82,000
Jarbidge Forks	0	1,000	100	0	7	200
Little Pilgrim	0	100	100	0	2	100
Salmon Falls Reservoir	0	0	100	0	8	4,000

[A] This SRMA is called Hagerman-Owsley Bridge in the No Action Alternative.

Jarbidge Foothills

The Jarbidge Foothills SRMA would have a focus on primitive recreation which would not likely result in the installation of new infrastructure in the area, thereby maintaining habitat patch size of aspen, mountain mahogany/mountain shrub, sagebrush steppe, and riparian habitats. Impacts to wildlife habitat would be negligible at the local scale and negligible at the planning area scale in the short and long term.

Because of the focus on primitive recreation, new infrastructure would not likely be developed. Route density would not increase. Human disturbance would primarily be associated with dispersed recreation (e.g., vehicle use on roads or primitive roads, hiking, camping, and horseback riding) in the summer and hunting in the fall. Although big game winter range is present, route density due to recreation would not change. Noise would usually be of short duration and would not result in long-term wildlife displacement. Impacts to wildlife habitat would be negligible at the local scale and negligible at the planning area scale in the short and long term.

Jarbidge Forks

Human disturbance impacts to wildlife would be the same as the No Action Alternative. No additional loss of riparian or canyonland group habitat would occur.

Little Pilgrim

Recreation use has resulted in short segments of new routes to go around parts of the road damaged in the spring and summer. As a result, sagebrush steppe habitat was divided and reduced. Vegetation would increase on routes closed due to less use or if the route was restored. In the long term, this should increase habitat by uniting smaller patches to form larger patches of habitat. Increases in habitat size are expected to be minor at the local scale and negligible at the planning area scale long term.

The Little Pilgrim SRMA is currently used year round by recreationists, primarily for fishing. Infrastructure is expected to increase. Improvements would likely include upgrading and graveling the primary routes to eliminate future route braiding, delineating and graveling parking areas to reduce resource damage, and installing barriers in selected areas to reduce future route expansion. Other infrastructure could include picnic tables, fire rings, vault toilet, and a kiosk may be added. A site plan with specific projects would be analyzed in more detail prior to development. The vast majority of habitat in this SRMA consists of grassland group habitat with a limited amount of sagebrush steppe and canyonland group habitats. Improved access would likely attract additional use. Impacts to wildlife would include temporary disturbance near the parking areas and other facilities.

Salmon Falls Reservoir

Portions of access roads to some of the more popular sites have parallel (braided) routes created to avoid ruts, mud, rocks, or “powdered” areas in the user created routes. Current use has divided sagebrush

steppe and grassland habitats reducing patch size. Route designation and spot treatment would reduce future route braiding thereby maintaining patch size.

Current use has created primitive multiple routes, poorly defined parking areas, camp sites, and turn-arounds. Infrastructure development in this SRMA would be generally limited to minor improvement of designated access routes, improved parking areas, barriers to define parking areas and protect vegetation, boat ramps, and vault toilets for sanitation. Improving the parking areas and turn around sites by installing strategic barriers would limit future damage to habitat by recreationists to sagebrush steppe habitat. The vast majority of human activity in the Salmon Falls Reservoir SRMA currently occurs near the shoreline including below the high water mark. Improving routes would likely increase use (disturbance) in the area which could increase vehicle mortality to reptiles or small mammals. Effects to reptiles or small mammals within the SRMA would be localized and minor. Effects of site-specific projects would be analyzed in more detail for each Recreation Management Zone (RMZ).

Impacts from Management Specific to Alternative II

Impacts from the Jarbidge Forks SRMA would be the same as described in the No Action Alternative. Impacts from the Little Pilgrim and Salmon Falls Reservoir SRMAs would be the same as described in Alternative I. The Deadman/Yahoo SRMA would not be designated and the area currently open to cross country motorized vehicle use would be closed and not used, which would increase patch size in grassland habitat, reduce infrastructure (trails), and reduce human disturbance associated with motorized recreation in long term. Effects would be minor at the local scale and negligible at the planning area scale.

Impacts from Management Specific to Alternative III

Impacts from the Jarbidge Forks SRMAs would be the same as described in the No Action Alternative. Impacts from the Balanced Rock, Deadman/Yahoo, and Salmon Falls Reservoir SRMAs would be the same as described in Alternative I. The Deadman/Yahoo SRMA would be approximately 1,500 acres smaller but the open areas would be nearly the same size, resulting in slightly less but similar impacts to wildlife as Alternative I.

Impacts from Management Specific to Alternative IV

Impacts from the Jarbidge Forks SRMAs would be the same as described in the No Action Alternative. Impacts from the Canyonlands, Deadman/Yahoo, and Salmon Falls Reservoir SRMAs to wildlife and habitat would be the similar to those described in Alternative I; and slightly reduced in the Deadman/Yahoo SRMA because of its smaller size.

Impacts from Management Specific to Alternative V

Impacts from the Jarbidge Forks and Yahoo SRMAs would be similar to those described in the No Action Alternative. Impacts from the Salmon Falls Reservoir SRMA would be the same as described in Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Infrastructure for Balanced Rock and Little Pilgrim SRMAs would be the same as described in Alternative I with the same effects. Impacts associated with the Jarbidge Forks would be the same as described in the No Action Alternative. Acres or miles of wildlife group habitat by Extensive Recreation Management Area (ERMA) are shown in Table 4-116.

Table 4-116. Wildlife Group Habitat for each Extensive Recreation Management Area for Alternative VI (Proposed RMP)

ERMA	Group Habitat					
	Aspen (Acres)	Canyonland (Acres)	Grassland (Acres)	Mountain Mahogany/ Mountain Shrub (Acres)	Riparian (Miles)	Sagebrush Steppe (Acres)
Canyonlands	20	16,000	90,000	70	43	43,000
Jarbidge Foothills	2,500	3,500	29,000	16,000	61	82,000
Rosevear	0	0	18,600	0	0	300
Luds Point	0	0	20	0	0	2,200

No additional route infrastructure would be associated with the Canyonlands, Jarbidge Foothills, and Luds Point ERMAs which would maintain habitat patch size. Luds Point ERMA would be formed from Luds Point RMZ of the Salmon Falls SRMA, but be managed less intensively. Sections of the access road to Luds Point has parallel routes created users to avoid ruts, mud, rocks or powdered areas. Spot treatment of access road to Luds Point would eliminate current and future parallel routes and facilitate recovery of parallel improving habitat for sage-grouse. A small parking area and boat ramp may be installed to reduce impacts to vegetation from vehicles parking and turning around. Although the ERMA boundary encompasses over 2,200 acres, only a small portion ERMA would be disturbed by routes and the parking area. If installed a boat ramp would not extend into sagebrush habitat.

The Rosevear ERMA (19,000 acres) lies between Deadman and Yahoo SRMAs. Designating some of the connecting routes the two areas would maintain disturbance corridors. Routes not designated would become vegetated in the long term increasing grassland habitat size. Designation of trails between Yahoo and Deadman may reduce some parallel routes in close proximity which would result in a minor reduction of route density at the local scale. Any new or realigned routes would split primarily grassland habitat and would partially offset reductions in route density.

Route density due to recreation in the Jarbidge Foothills and Canyonland ERMAs would not increase in group habitat or big game winter range. Human disturbance would be similar to that described in the No Action Alternative for the Jarbidge Forks. Impacts for the remaining combination of ERMAs and SRMAs for infrastructure and human disturbance would be similar to Alternative I. Impacts to wildlife and wildlife group habitats would be minor at the local scale and negligible at the planning area scale.

Impacts from Transportation and Travel Actions

Routes and route density fragment habitat, influence wildlife habitat use (Barton and Holmes, 2007; Ingelfinger and Anderson, 2004; Lyon and Anderson, 2003; Rowland et al., 2000), and can be a source of wildlife mortality (Connelly et al., 2004; Harrington and Conover, 2006).

Research on road impacts in sagebrush steppe habitat (Wyoming big sagebrush) in Wyoming found 39% to 60% reductions in sagebrush steppe bird nests, specifically sage sparrow and Brewer's sparrow, within 100 meters of roads with low traffic volumes (less than 12 vehicles per day, Ingelfinger and Anderson, 2004; 5 vehicles per day, Gilbert and Chalfoun, 2011). The full impact area where reduced habitat use occurred was substantially larger than the footprint of the actual roadbed. Ingelfinger and Anderson reported that vehicle traffic alone may not be the only cause of sagebrush obligates avoiding habitat near roads in sagebrush steppe, but attributed decreased use to avoiding the habitat edge and possibly due to increased competition from other bird species using open habitat (Ingelfinger and Anderson, 2004).

Coyotes and other predators readily use routes, in part for the ease of travel, which may increase predation near the routes. Routes also increase access for hunters, resulting in greater hunting pressure and increased game mortality (Gratson and Whitman, 2000; Hayes et al., 2002). Finally, because roads absorb heat, they are used by reptiles for basking in the mornings and evenings from spring through early fall, which make reptiles vulnerable to mortality from vehicles at these times.

Research on the effects of graveled roads, dirt roads, or jeep trails on small mammals, birds, and reptiles are limited. Locally, reptiles, birds, and mammals have been noted road killed on paved, gravel roads and two tracks routes. In the Snake River Plain in Idaho, Jochimsen (2006) noted that along paved roads mortality varied among snake species, age class and time of year. In southern California in a sagebrush scrub habitat some rodents altered habitat use in the presence of paved roads and highways but not dirt roads (Brehme, 2003). Rodents crossed dirt roads but avoided crossing paved roads (Brehme, 2003). Lizards readily crossed dirt and paved roads in this study. Dirt roads were a source of mortality to reptiles and small mammals (Brehme, 2003) with small mammal and reptile mortality proportionately higher on dirt roads compared to paved roads. Similar research regarding road type has not been conducted in sagebrush habitats of the northern Great Basin or southern Idaho. Potential impacts to wildlife populations in the planning area would generally be localized and minor both short and long term.

The majority of the main gravel roads receive some type of scheduled maintenance, which includes grading, crowning, spreading gravel, pulling ditches, and installing culverts. The majority of the maintenance is conducted in the late spring while the roads still contain some moisture. The majority of the road maintenance is typically conducted from 9:00 AM or later through the late afternoon. Road maintenance may disrupt some breeding or nesting birds in close proximity to the road. This disturbance is usually minor and because the road grader is moving, lasts for a short duration (a few minutes). New roads reduce and fragment whatever group habitat is present. The impacts of the road to wildlife can extend well past the physically disturbed area.

The following indicator was used to analyze the impacts of Transportation and Travel actions on wildlife habitat:

- Acres with management emphasis (acres of Travel Management Area (TMA) management focus, and exceptions).

Impacts from Management Specific to the No Action Alternative

The majority of BLM-managed land Twin Falls County and all of Elmore County and Elko County (342,000 acres) within the planning area would remain open for cross-country motorized or mechanized vehicle use. Public lands within Owyhee County would be subject to a Travel Management Plan pursuant to the Omnibus Public Lands Management Act of 2009. Under current management, various permit holders, hunters, sight seers, and motorized recreationists created new routes and in some cases dividing previously contiguous habitats and would continue. Due to generally low amounts of off-highway vehicle use at the planning area scale, impacts (burrow collapse, injury or mortality, displacement) to birds, reptiles, or small mammals would be limited and would be considered minor to negligible at the local level and negligible at the planning area scale in both the short and long term. Other effects of existing routes would remain limited to the currently influenced areas.

In areas closed, the present route density would remain unchanged or decrease in designated wilderness as some routes are closed. As closed routes revegetate sagebrush steppe habitat would slightly increase and become less divided. For the most part canyonland habitat is naturally protected by steep topography and rocky canyon rims.

No TMAs are in the No Action Alternative, therefore no TMAs have an objective of reducing route density.

Impacts from Management Specific to Alternative I

The Canyonlands, Jarbidge Foothills and Snake River TMAs have a management to reduce route density. All aspen and mountain mahogany/mountain shrub group habitats and the majority of big game winter range are in these TMAs. Reducing route density would increase habitat vegetation increases in the long term on closed routes. Restoring closed routes would speed recovery (Switalski et al., 2004). Without restoration recovery of closed routes would likely take decades.

Management focus in the Devil Creek TMA would not change routes appreciably generally maintain sagebrush steppe and grassland habitat. Routes in the Deadman/Yahoo TMA would likely increase reducing primarily grassland habitat.

Allowing cross-country motorized vehicle use for game retrieval would likely result in the creation of new routes. Authorizing lease, permit, and right-of-way (ROW) holders driving cross-country would partially offset or negate benefits of reducing routes. Both these actions would likely maintain or increase route density and increase disturbance to wildlife to a limited degree. Reductions in habitat and human disturbance would likely be minor to moderate at the local scale and negligible to minor at the planning area scale.

About 4,000 acres (less than 0.3%) of the planning area would remain open to motorized cross-country travel. Within the open areas play areas such as hill climbs would expand, high use routes would widen, and new routes would form connecting higher use sites. As a result grassland habitat would experience a minor to moderate decrease at the local scale in the short term. At the planning area scale the decrease in grassland habitat would be negligible at the planning area scale. Some bird species nesting close to higher use routes and play areas would likely be displaced. Damage to nests would be infrequent and limited to the spring and early summer.

Table 4-117. Wildlife Group Habitat and Big Game Winter Range in Travel Management Areas for Alternative I

Habitat	TMA				
	Canyonland	Deadman/ Yahoo	Devil Creek	Jarbidge Foothills	Snake River
Aspen (acres)	< 100	0	0	2,500	0
Canyonland (acres)	33,000	0	10,000	3,400	500
Duneland (acres)	0	0	0	0	700
Grassland (acres)	110,000	39,000	501,000	29,000	302,000
Mountain Mahogany/ Mountain Shrub (acres)	100	0	0	16,000	0
Sagebrush Steppe (acres)	69,000	1,400	154,000	83,000	11,000
Total	**212,000**	**40,000**	**675,000**	**134,000**	**314,000**
Riparian (miles)	127	3	81	70	35
Big Game Winter Range (acres)	280,000	0	559,000	135,000	2,500

Impacts from Management Specific to Alternative II

In the Canyonland TMA management focus would be to retain the amount of routes similar to present levels on 213,000 acres. Additional damage to sagebrush steppe and grassland habitats would be minor to negligible in the short and long term at the local scale. Keeping the current mileage of designated routes would maintain generally low levels of human disturbance. If route surfaces were improved, use would increase in the area. Increased use during the winter would likely displace some wintering wildlife.

Route density would increase in the Bruneau Desert TMA (1,159,000 acres) in Alternative II. Route increases, generally associated with land use projects, would reduce and divide wildlife group habitats and encourage human disturbance. The Bruneau Desert TMA contains the majority of big game winter range, aspen, grassland, mountain mahogany/mountain shrubs and sagebrush steppe habitats. Increasing routes in big game winter range would also increase disturbance to wildlife. Habitat loss and division would be negligible to moderate at the local scale in the short and long term. Increases in routes would be minor at the land scape scale in the long term.

Granting permit or lease holders exemptions to motorized cross-country travel restrictions would increase gradually the number of routes and reduce habitat in all groups. Declines in group habitat from exempted permit holders would be minor at the local scale and minor at the planning area scale.

No areas would be open. As vegetation establishes in the high use areas there would be a minor increase at the local scale in grassland group habitat in the long term. Nest loss in open areas would be avoided. In the long term, the increase in grassland would be negligible at the landscape scale.

Table 4-118. Wildlife Group Habitat and Big Game Winter Range in Travel Management Areas for Alternative II

Habitat	TMA	
	Bruneau Desert	Canyonland
Aspen (acres)	2,500	< 100
Canyonland (acres)	13,500	32,600
Duneland (acres)	700	0
Grassland (acres)	872,000	110,000
Mountain Mahogany/Mountain Shrub (acres)	15,800	100
Sagebrush Steppe (acres)	250,000	69,000
Total	**1,155,000**	**212,000**
Riparian (miles)	189	127
Big Game Winter Range (acres)	697,000	208,000

Impacts from Management Specific to Alternative III

The majority of the area would be managed in general to retain the current routes. Group habitat and big game winter range for each TMA is displayed in Table 4-119. Routes improved or new routes created for wildland fire suppression would increase human disturbance in areas that presently have little disturbance. New routes would reduce or divide habitats. Reductions in habitat would be minor to moderate at the local scale in the short term and minor in the long term. At the landscape scale habitat reduction would be negligible in the long term. Shifts in wildlife use would generally be localized. Routes and disturbance in big game winter range may remain the same or increase slightly.

The Deadman/Yahoo TMA, which is nearly all grassland habitat, would increase routes reducing grassland habitat in this TMA. A reduction of grassland habitat for routes would be minor at the local scale and negligible at the planning area scale.

Cross-country motorized vehicle use for game retrieval would be prohibited, reducing one source of new routes that would be most noticeable in sagebrush steppe and mountain mahogany/mountain shrub habitats. Authorizing various permit holders to use motor vehicles for cross-country travel would likely keep undesignated routes open and contribute to the creation of new routes. Loss of wildlife habitat would be minor at the local scale and negligible to minor at the planning area scale in the short and long term.

About 4,000 acres would be categorized as open to motorized vehicles and impacts would be the same as Alternative I.

Table 4-119. Wildlife Group Habitat and Big Game Winter Range in Travel Management Areas for Alternative III

Habitat	TMA				
	Deadman/ Yahoo	Devil Creek	Jarbidge Foothills	Snake River	West Side
Aspen (acres)	0	0	2,500	0	< 100
Canyonland (acres)	0	9,000	3,400	500	33,500
Duneland (acres)	0	0	0	700	0
Grassland (acres)	33,000	362,000	29,000	300,000	259,000
Mountain Mahogany/Mountain Shrub (acres)	0	0	16,000	0	100
Sagebrush Steppe (acres)	1,000	113,000	83,000	9,000	112,000
Total	**34,000**	**484,000**	**134,000**	**39,000**	**405,000**
Riparian (miles)	1	69	70	37	139
Big Game Winter Range (acres)	0	396,000	135,000	1,000	373,000

Impacts from Management Specific to Alternative IV

Canyonlands, Devil Creek, Jarbidge Foothills and Snake River TMAs have a management focus to decrease routes. Restoration of closed routes would increase habitat for sagebrush steppe, aspen, and mountain mahogany/mountain shrub group wildlife.

The Deadman/Yahoo TMA would increase routes and have an open area similar to Alternative I with the same impacts to grassland habitat at the local and landscape scale.

Using motorized vehicles to travel cross-country for game retrieval would be prohibited which would eliminate this source of route creation. Permit and ROW holders could be granted exemptions to the use of motorized vehicles for cross-country travel would have the same effects as described in Alternative I. The amount of wildlife group habitats would be the same as given in Alternative I, except Deadman/Yahoo TMA would lose about 5,000 acres of grassland habitat whereas the Snake River TMA would gain 5,000 acres of grassland habitat.

Impacts from Management Specific to Alternative V

Four TMAs have management focus of reducing routes on all but 3,000 acres of the planning area. Group habitat and big game winter range in TMAs is displayed in Table 4-120. Closed routes would revegetate in the long term creating a negligible increase in aspen, grassland, sagebrush steppe, mountain mahogany/mountain shrub habitats. Routes in big game winter range should decrease as closed routes re-establish vegetation. Increases to wildlife habitats would be minor to negligible at the local scale and negligible at the planning area scale in the short and long term.

Only the 3,000 acre Yahoo TMA which is grassland habitat has an objective or increasing routes. Grassland group habitat would have a minor decrease in the short and long term. At the planning area scale the decrease in grassland habitat would be negligible in both the short and long term.

Cross-country motorized vehicle use for game retrieval would be prohibited. Lease, permit, and ROW holders would be required to stay on designated routes. These management actions would effectively reduce the creation of new routes in the short and long term. Wildlife habitat would be retained at the local and planning area scales in the short and long term.

The 1,000 acre open area is mostly grassland habitat which would result in a minor reduction of grassland habitat at the local scale in the short and long term. Occasionally bird nesting in or adjacent to the open area would be damaged.

Table 4-120. Wildlife Group Habitat and Big Game Winter Range in Travel Management Areas for Alternative V

Habitat	TMA				
	Devil Creek	Jarbidge Foothills	Snake River	West Side	Yahoo
Aspen (acres)	0	2,500	0	20	0
Canyonland (acres)	9,000	3,400	500	34,000	0
Duneland (acres)	0	0	700	0	0
Grassland (acres)	362,000	29,000	330,000	259,000	3,000
Mountain Mahogany/Mountain Shrub (acres)	0	16,000	< 20	100	0
Sagebrush Steppe (acres)	113,000	83,000	10,000	112,000	300
Total	**484,000**	**134,000**	**341,000**	**304,000**	**3,000**
Riparian (miles)	69	70	37	139	1
Big Game Winter Range (acres)	396,000	135,000	1,000	376,000	0

Impacts from Management Specific to Alternative VI (Proposed RMP)

The only TMA with a goal to increase routes would be the Deadman/Yahoo (35,000 acres) primarily connecting 4,000 acre open areas. Route density in grassland habitat would increase over time in this

TMA. A goal to reduce route occurs only in the Jarbidge Foothills TMA (135,000 acres). The remaining three TMAs covering majority of the planning area have a goal of keeping routes similar to current amounts. Cross-country motorized vehicle use for game retrieval would be prohibited, resulting in less damage, in sagebrush steppe and mountain mahogany/mountain shrub habitats. Future damage from motorized vehicles on big game winter range in the Jarbidge Foothills would be minimized. Various permit and ROW holders could be granted exemptions for cross-country motorized travel which would likely offset routes reduced in the Jarbidge Foothills TMA and increase routes in other the other TMAs. Table 4-121 displays the current amount of group habitat in each TMA. Sagebrush steppe and mountain mahogany/mountain shrub habitats would negligibly increase in the Jarbidge Foothills TMA as closed routes revegetate. An increase in habitat would likely be minor to at the local scale and negligible at the planning area scale.

The acreage of open, closed, and limited to designated routes in Alternative VI would be the similar as in Alternative III with similar effects. Loss of habitat would be minor at the local scale and negligible at the planning area scale in the short and long term.

Table 4-121. Wildlife Group Habitat and Big Game Winter Range in Travel Management Areas for Alternative VI (Proposed RMP)

Habitat	TMA				
	Canyonlands	Deadman/Yahoo	Devil Creek	Jarbidge Foothills	Snake River
Aspen (acres)	20	0	0	2,500	0
Canyonland (acres)	32,000	0	10,000	3,400	1,000
Duneland (acres)	0	0	0	0	1,000
Grassland (acres)	96,000	33,000	508,000	29,000	316,000
Mountain Mahogany/ Mountain Shrub (acres)	100	0	0	16,000	< 100
Sagebrush Steppe (acres)	59,000	2,000	163,000	83,000	12,000
Total	**187,000**	**35,000**	**681,000**	**134,000**	**330,000**
Riparian (miles)	126	1	81	70	38
Big Game Winter Range (acres)	186,000	0	573,000	135,000	11,500

Impacts from Land Use Authorizations Actions

Land use authorizations that result in increased infrastructure (e.g., power lines, roads, towers, wind turbines) and routes contribute to direct habitat loss, wildlife disturbance, and mortality (American Society of Mammalogists, 2008; Arnett et al., 2007; Barclay et al., 2007; Connelly et al., 2004; Harrington and Conover, 2006; Ingelfinger and Anderson, 2004; Lyon and Anderson, 2003; Rowland et al., 2000; Steenhof et al., 1993; Wisdom et al., 2000). The impacts of increasing infrastructure depend on the species, specific location, and scale of the project (i.e., wind energy development would have more impacts than a single communication site due to the larger project footprint and amount of structures). Communication sites, meteorological towers, power lines, and wind turbines are collision hazards to a number of bird and bat species (Arnett et al., 2008; Arnett et al., 2007; Barclay et al., 2007).

In southern Idaho, power lines provide raptors and ravens with increased nesting and perching sites (Steenhof et al., 1993). Raptors are known to use towers on poles as perch sites for hunting (Steenhof et al., 1993), which may change predation rate in uplands within and adjoining the corridors. Connelly and others (2004) expressed concerns regarding the influence of tall structures on sage-grouse use of habitat. Depending on configuration, power poles for smaller distribution lines can also be an electrocution hazard for raptors.

No studies have specifically examined mortality rates to gray partridge or pheasant associated with wind energy development in the Intermountain West. In Minnesota, gray partridge and pheasants accounted

for 1.8% and 3.6 % of the avian mortality associated with a wind energy development (Johnson et al., 2002) whereas no gray partridge or pheasant were killed in a wind energy development in California (Smallwood and Thelander, 2008). Bat and avian mortality at wind energy projects vary widely between project and were likely influenced site specific conditions as well as season, weather, and time of day. In a study with limited pre-construction data at a 45 turbine wind energy project in Oklahoma, elk did not leave the study area during construction and home range sizes pre and post construction were not significantly different (Walter et al., 2006). It is unknown if elk would react similarly in the planning area due to differences in habitat, topography and other factors. Assuming that road impacts from oil and gas development in Wyoming would be similar to roads for renewable energy development in the planning areas, some ground- and shrub-nesting birds would be displaced by roads (Ingelfinger and Anderson, 2004; Lyon and Anderson, 2003, Gilbert and Chalfoun, 2011). In an already developed area with less disturbance (little active drilling) bird abundance remained low even in areas with low traffic volumes (five vehicles per day, Gilbert and Chalfoun, 2011). Reduction in habitat effects are expected to be substantially larger than the area actually disturbed. For roads the effect could be at least 660 feet (Ingelfinger and Anderson, 2004) for some sagebrush nesting birds. For wintering mule deer the distance could be farther, 0.6 miles (Sawyer et al., 2006), depending on the type of project and amount of human activity. Disturbance during construction is expected to displace some wildlife to areas with less activity within their home range, shift their home range or cause them to move from the area.

The following indicator was used to analyze the impacts of Land Use Authorizations actions on wildlife habitat:

- Acres with management emphasis (available, avoidance, exclusion).

Impacts from Management Specific to the No Action Alternative

Additional transmission lines within utility right-of-way (ROW) corridors would increase the routes and infrastructure primarily within grassland habitat in the corridor. Wind energy development in the southern portion of the planning area would reduce route density in aspen, mountain mahogany/mountain shrub, and sagebrush steppe habitats. Infrastructure density would also increase in big game winter range in the southern portion of the planning area. Stipulations regarding spatial or timing restrictions may be applied to reduce disturbance to wildlife during project construction or subsequent routine maintenance. However, this would not address impacts of the operation of renewable energy projects. The No Action Alternative does not provide direction with respect to limiting new ROWs to existing disturbance corridors where practical. The lack of direction would contribute to increasing route and infrastructure density. Route and infrastructure at renewable energy projects would likely result in moderate or greater impacts at the local scale in both the short and long term. At the planning area scale impacts would likely be minor in the short and long term.

The No Action Alternative identified 374,000 acres outside avoidance areas. Of this, 315,000 acres is available for wind energy or renewable energy development. Because the wind resource varies the expected wind energy development area would be about 111,000 acres. Approximately 884,000 acres would be available consistent with avoidance stipulations. Of this 800,000 would be available for renewable energy projects if a project is consistent with avoidance stipulations. To protect a variety of resources, the remaining area would not be available.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The Bruneau-Jarbidge Rivers Wilderness (60,000 acres) and Salmon Falls Creek Wilderness Study Area (2,000 acres) are ROW exclusion areas. Wildlife group habitats within the exclusions areas consist of canyonland, grassland, and sagebrush steppe habitats and about 104 miles of riparian habitat. Wildlife group habitat in these areas would retain their current route/infrastructure density associated with land use authorizations.

Table 4-122. Wildlife Group Habitat and Big Game Winter Range in Right-of-Way Exclusion Areas by Alternative

Habitat	Alternative						
	No Action	I	II	III	IV	V	VI
Aspen (acres)	0	0	0	0	200	200	0
Canyonland (acres)	22,000	22,000	22,000	22,000	23,000	30,000	22,000
Duneland (acres)	0	0	0		00		0
Grassland (acres)	20,000	21,000	20,000	21,000	23,000	48,000	21,000
Mountain Mahogany/ Mountain Shrub (acres)	0	0	0	0	6,000	6,000	0
Sagebrush Steppe (acres)	20,000	20,000	20,000	20,000	47,000	82,000	20,000
Total	**62,000**	**63,000**	**62,000**	**63,000**	**100,000**	**167,000**	**63,000**
Riparian (miles)	104	107	104	107	125	148	107
Big Game Winter Range (acres)	60,000	60,000	60,000	60,000	97,000	161,000	60,000

All alternatives have ROW avoidance areas. ROWs may be granted within avoidance areas as long as they are consistent with the avoidance criteria. Table 4-123 displays group habitat in ROW avoidance areas for the action alternatives.

Table 4-123. Wildlife Group Habitat and Big Game Winter Range in Right-of-Way Avoidance Areas by Alternative

Habitat	Alternative						
	No Action	I	II	III	IV	V	VI
Aspen (acres)	900	900	900	900	900	2,500	2,500
Canyonland (acres)	40,000	40,000	40,000	40,000	40,000	46,000	46,000
Duneland acres)	700	700	700	700	700	700	700
Grassland (acres)	750,000	753,000	753,000	753,000	753,000	848,000	855,000
Mountain Mahogany/ Mountain Shrub (acres)	4,000	4,000	4,000	4,000	4,000	16,000	16,000
Sagebrush Steppe (acres)	200,000	200,000	200,000	200,000	200,000	311,000	311,000
Total	**997,000**	**1,001,000**	**1,001,000**	**1,001,000**	**1,001,000**	**1,204,000**	**1,234,000**
Riparian (miles)	175	175	175	175	175	213	213
Big Game Winter Range (acres)	733,000	733,000	733,000	733,000	733,000	904,000	904,000

Although wind energy could be developed in all alternatives, the analysis focused on areas, expected wind energy development areas, where likelihood of development was higher because the wind resource was marginal or higher. Table 4-124 displays the amount of habitat within the expected wind energy development areas for each alternative. Some wildlife species could be displaced from an area larger than the project footprint acres.

Table 4-124. Wildlife Group Habitat and Big Game Winter Range in Expected Wind Energy Development Areas Categorized as Available by Alternative

Habitat	Alternative						
	No Action	I	II	III	IV	V	VI
Aspen (acres)	1,300	0	1,600	0	0	0	0
Canyonland (acres)	1,300	0	3,300	0	0	0	30
Grassland (acres)	54,000	45,000	56,000	40,000	36,000	31,000	21,000
Mountain Mahogany/ Mountain Shrub (acres)	9,000	0	12,000	0	0	0	0
Sagebrush Steppe (acres)	44,000	3,000	54,000	10,000	< 1,000	< 1,000	< 1,000
Total	**111,000**	**39,000**	**127,000**	**50,000**	**37,000**	**31,000**	**22,000**
Riparian (miles)	8	14	49	14	14	14	14
Big Game Winter Range (acres)	68,000	7,000	84,000	18,000	5,000	0	0

Pilgrim Gulch, Shoestring, Balanced Rock, and Saylor Creek utility ROW corridors remain in all alternatives and total about 30,000 acres. These utility ROW corridors are all located in the northern portion of the planning area in predominately grassland habitat. Existing infrastructure and routes created during construction and maintenance have been in place for decades. Additional utility lines would increase route and infrastructure density within the corridors. The routes are also accessed by other public land users, which locally increases human disturbance. New land use authorizations in available areas and in avoidance areas would increase infrastructure. Depending on the project type and location new routes may also be added. For example a ROW co-located at an existing communications site would likely require a building and tower. A ROW for a new communication site location would require a new access route, fencing, building, and tower which would have a greater impact than co-locating. Outside the ROW exclusion area, communication sites would be co-located to the extent possible to minimize reductions in habitat from buildings towers, and access routes. Spatial and temporal wildlife stipulations for project construction and maintenance would reduce disturbance impacts to wildlife from those activities. Increase in routes and infrastructure would be negligible to moderate at the local scale and negligible to moderate at the planning area scale in the long term depending on the project size, location, and other factors.

Table 4-125. Wildlife Group Habitat and Big Game Winter Range in Existing or Nominated Utility Right-of-Way Corridors

Habitat	Balanced Rock [A]	Jarbidge Nevada	Pilgrim Gulch [A]	Roseworth	Saylor Creek [A]	Shoe String [A]	Oil/Gas Pipelines
Aspen (acres)	0	0	0	0	0	0	0
Canyonland (acres)	0	1,000	0	200	0	0	0
Duneland (acres)	0	0	0	0	< 100	0	0
Grassland (acres)	8,000	19,000	4,000	400	10,000	4,600	11,000
Mountain Mahogany/ Mountain Shrub (acres)	0	< 100	0	0	0	0	0
Sagebrush Steppe (acres)	1,500	4,000	0	1,600	500	0	300
Total	**9,500**	**24,000**	**4,000**	**2,200**	**10,500**	**4,600**	**11,300**
Riparian (miles)	< 1	1	0	< 1	0	0	0
Big Game Winter Range (acres)	0	20,000	0	0	0	0	0

[A] Existing utility ROW corridors.

To the extent mule deer respond to renewable energy like they do to oil/gas developments, increased human activity and infrastructure density in big game habitat would displace wintering big game (Sawyer

et al., 2006). Route and infrastructure at renewable energy projects would likely result in moderate or greater density increases at the local scale in both the short and long term. Restoring habitat would potentially reduce some impacts of projects. To the extent restoration is successful, restored sagebrush steppe and mountain mahogany/mountain shrub habitats may take two or more decades to resemble intact habitat (i.e., plant height, composition, cover). At the local scale impacts of renewable energy projects would likely be moderate to high in the short and long term. At the planning area scale impacts of increased infrastructure would likely be minor to moderate. The majority of other ROWs are expected to be relative small and occur near private land. In these cases they would have a negligible or minor effect locally and a negligible to minor effect at the planning area scale in the short and long term.

Impacts from Management Specific to Alternative I

Management in Alternative I includes placing new ROWs in existing disturbance corridors where practical, which would limit an increase in route and infrastructure a result of new projects. See the *Impact from Management Common to the No Action Alternative and All Action Alternatives* above regarding renewable energy and other land use authorizations. Restoration would likely be used to mitigate impacts from some projects.

Alternative I would exclude ROWs from 63,000 acres. The added 1,000 acre exclusion area covers portions of Salmon Falls Creek Canyon from approximately Lilly Grade downstream to Balanced Rock Park. About 1,001,000 acres were identified as ROW avoidance areas, most of which are associated with military operating areas. Within the avoidance areas, ROWs on the surface or subsurface (roads, underground fiber optic cable, etc.) would likely be approved. ROWs for projects with tall structures may be granted if they are in compliance with avoidance criteria. The approximately 307,000 acres would be available for ROWs. ROWs, if authorized, in the available area would probably have standard stipulations. The Jarbidge Utility ROW Corridor (24,000 acres of BLM land) would be added in Alternative I. The route crosses 19,000 acres of grassland, 4,000 acres of sagebrush steppe, and 1,000 acres of canyonland habitat as well as riparian habitat associated with Salmon Falls and Clover Creeks, and the East Fork of the Jarbidge River. The proposed utility corridor follows an existing power line and primitive road that have been in place for many decades. Additional infrastructure in this corridor would be a wildlife collision hazard, decrease habitat, and increase human disturbance associated with project construction and maintenance and other incidental use.

Where the wind resource was determined to be marginal or better (expected wind energy development areas) Alternative I would have just over 48,000 acres available for wind energy development without avoidance stipulations. Acres of group habitat and big game winter range in the expected wind energy development areas are listed in Table 4-124.

Development of wind energy in the northeastern portion of the planning area would primarily impact grassland habitat (greater than 95%). Much of the grassland habitat in the area is seeded with non-native perennial grasses with varying amounts of annual grasses present. There are several wind projects already present in the area south and west of Hagerman, therefore new developments may require less infrastructure. Little research, on the impacts of renewable energy has been conducted in grassland or sagebrush habitats in the Northern Great Basin. To the extent wind energy is developed infrastructure and disturbance would increase and grassland habitat decrease moderate to major at the local scale and negligible to minor at the landscape scale in the short and long terms. Wildlife displacement and wildlife mortality would be localized near specific project areas. Aspen and riparian group habitats could be reduced in small by routes crossing them to access turbines or transmission lines. Loss of habitat would generally be localized and minor to moderate at the local scale. No routes and limited other wind energy infrastructure (power lines) would be expected in Canyonland habitat. Wind energy development would have no or a negligible short- or long-term habitat loss. Canyonland, aspen, and riparian groups' habitat loss would be similarly negligible at the landscape scale in the long term for the action alternatives.

Impacts from Management Specific to Alternative II

New ROW could be located in previously undisturbed sites even if a disturbed area was already present, resulting in habitat loss and new infrastructure and disturbance increase at the local scale.

The ROW exclusion area in Alternative II would decline 1,000 acres to a total of 62,000 acres. Within this area group habitat would not decrease due to land use authorizations. Designated utility ROW corridors and ROW avoidance areas would be the same as in Alternative I with similar impacts. Impacts of renewable energy would be greater than Alternative II due to the larger (127,000 acres) area available and types of habitats involved. Increases in infrastructure, routes, and disturbance would be moderate to major at the local scale, both short and long term. At the planning area scale, depending on the site specific group habitats, impacts would be negligible to minor in the short and long term.

Although grassland habitat dominates both expected wind energy available and available with stipulations areas sagebrush steppe increases from a little over 3,000 acres to approximately 54,000 acres or about a sixth of the sagebrush steppe habitat in the planning area. Within this area renewable projects would reduce grassland, sagebrush steppe and mountain mahogany/mountain shrub habitats, routes would split habitats, and turbines and power lines would be a source of mortality for songbirds, raptors, and bats locally. Approximately, 84,000 acres of big game winter range are within the expected energy areas. Alternative II would increase habitat loss and disturbance from land use authorizations on big game winter range due to maintenance and operation. Decreases in sagebrush steppe and mountain shrub/mountain mahogany would have a larger impact on big game during severe winters. Habitat loss, disturbance or displacement associated with construction, maintenance and operation would be minor to major at the local scale in the short term. In the short term, mitigation would not reduce impacts. Mitigation in the long term would decrease habitat loss to negligible to moderate at the landscape scale.

Impacts from Management Specific to Alternative III

The effects of limiting new land use authorization to existing disturbed areas would be the same as in Alternative I with similar impacts.

The ROW exclusion areas and ROW utility corridors in Alternative III would be the same as Alternative I with the same impacts. Sagebrush steppe within the expected wind energy areas would increase to 10,000 acres but would remain less than 4% sagebrush in the planning area. Displacement effects could be substantially larger than the project footprint acres. Big game winter range would be approximately 18,000 acres in the area available and available with stipulations for wind energy development, but it is less than 3% of the total big game winter range. New land use authorizations would increase infrastructure impacts (habitat loss, displacement, and increased disturbance) minor to moderate at the local scale in the short term. In the long term, impacts would be negligible to minor at the landscape scale.

Impacts from Management Specific to Alternative IV

The effects of direction in Alternative IV limiting new land use authorization to existing disturbed areas would be the same as in Alternative I with similar impacts.

ROW utility corridors would be the same as Alternative I with the same impacts.

Alternative IV would increase the amount of ROW exclusion areas to approximately 97,000 acres. Within the exclusion area ROW infrastructure and associated disturbance would not decrease in wildlife habitat. The 97,000 acre ROW exclusion areas represent approximately 7% of the planning area where wildlife displacement from infrastructure, routes and disturbance to wildlife and their habitat would be minimal. The amount of group habitat in the expected wind energy development area is approximately 37,000 acres of which nearly 97% is grassland group habitat. No big game winter range would lie within and impacts would be similar to Alternative V. Loss of grassland habitat and increases in infrastructure and disturbance would be localized and minor to moderate depending on project size and specific location. Long-term habitat reduction and divisions would be negligible to minor at the land scape scale.

Impacts from Management Specific to Alternative V

The effects of direction in Alternative V limiting new land use authorization to existing disturbed areas would be the same as Alternative I with similar impacts.

Alternative V would have a 167,000 ROW exclusion area. Wildlife habitat would not decrease and infrastructure and disturbance would not increase wildlife displacement due to land use authorizations within the exclusion area. The ROW avoidance area increases to about 1,204,000 acres. The increase in acreage (198,000 acres) would be due to the nominated Sagebrush Sea Area of Critical Environmental Concern (ACEC) in this alternative. However, much of the nominated ACEC is already a ROW avoidance area. The expected wind energy development area would be 31,000 acres. All the expected wind energy area is grassland habitat. Route or infrastructure may divide some small scattered sagebrush steppe islands. Loss of grassland habitat and increases in infrastructure and disturbance would be localized and minor to moderate depending on project size and specific location. No big game winter range lies within expected wind energy area which eliminates potential winter range loss, fragmentation and displacement of big game.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The effects of direction in Alternative VI limiting new land use authorization to existing disturbed areas would be the same as in Alternative I with similar impacts.

The ROW exclusion area is the same size as Alternative I and would have the same configuration and impacts.

Alternative VI would drop the Jarbidge Nevada utility ROW corridor, but add the Roseworth and Oil/Gas utility ROW corridors. Acreage of sagebrush in utility ROW corridors would decrease and a net decrease of 10,000 acres within utility ROW corridors. Grassland habitat occupies over 95% of the added Oil/Gas corridor. New in pipelines would be place in the oil and gas corridor increasing the number of maintenance roads and associated disturbance. The Roseworth Corridor is about 85% sagebrush steppe with some canyonland, grassland, and riparian habitats. The riparian area is in the bottom of Salmon Falls Creek Canyon where infrastructure would be prohibited which would eliminate direct loss of riparian and canyonland habitats. Both the Oil/Gas and Roseworth utility ROW corridors have had existing infrastructure in place for decades.

Alternative VI has the most ROW avoidance area (1,234,000 acres), in part because of the inclusion of the sage-grouse management area as avoidance. The expected wind energy development is limited to 22,000 acres nearly all grassland habitat in the northern portion of the planning area. Route or infrastructure may divide some small scattered sagebrush steppe islands within the grassland area. Loss of grassland habitat and increases in infrastructure and disturbance would be localized and minor to moderate depending on project size and location.

Impacts from Minerals Actions

Site specific environmental analysis would be completed prior to the exploration and development of mineral resources. Mineral development would increase infrastructure and human disturbance in areas where development occurs and could locally alter wildlife habitat use (Connelly et al., 2004; Doherty et al., 2008; Holloran et al., 2005; Ingelfinger and Anderson, 2004; Walker et al., 2007a). Leasable, locatable, and salable minerals were analyzed as common to the No Action Alternative and all action alternatives if the probability for substantial development is low.

The majority of the locatable mineral withdrawal recommendations are located within canyons, including portions of the Bruneau, Jarbidge, and Salmon Falls Creek Canyons. No sites within the planning area are identified as having a moderate or higher probability of having extractable quantities of locatable minerals and locations of future exploration, development, or production are unknown; therefore, impacts are not addressed further.

Salable mineral development within the planning area occurs over 1,300 acres. The acres of salable mineral development are expected to increase by 1,000 to 2,000 acres; this small increase is negligible at the planning area scale particularly when numerous existing pits would mostly be expanded. Therefore, impacts of salable mineral development are discussed under management specific to the No Action Alternative and all action alternatives. Oil and Gas and geothermal potential areas are the same for all alternatives however, the acreage open, open with restrictions, and closed vary by alternative. The

potential for commercial development of leasable minerals is low. Differences between the alternatives are displayed in tables and are discussed under management specific to the No Action Alternative and all action alternatives.

The following indicator used to analyze impacts from Minerals actions to wildlife habitat:

- Acres with management emphasis (open or open with restrictions).

Areas open with restrictions (no surface occupancy, seasonal, or other restrictions) would reduce impacts of construction to wildlife.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Leasable Minerals

Oil and Gas. No producible oil or natural gas has been located to date in south central Idaho. Oil and gas is only potentially present on approximately 307,000 acres in two areas (China Mountain and Glenns Ferry). Oil and gas exploration would contribute to the creation of new primitive roads and localized damage to habitat where exploration occurs. No new routes would be created in areas closed to oil and gas development which varies by alternative. Depending on the seismic testing method some new routes may be created. If seismic testing indicates oil or gas is present, up to two miles of temporary roads would be constructed to transport and maintain equipment for exploration wells. Within the potential oil and gas areas Grassland habitat is most common and Duneland habitat is least. New routes would reduce and split habitats.

Table 4-126. Areas with Potential for Oil and Gas Resources (Acres)

Category	Alternative					
	I	II	III	IV	V	VI
Closed	11,000	< 1,000	5,000	35,000	41,000	5,000
Open	185,000	288,000	288,000	189,000	209,000	189,000
Open – No Surface Occupancy	19,000	14,000	9,000	19,000	19,000	19,000
Open – Seasonal Restrictions	88,000	0	0	59,000	35,000	87,000
Open – Other Restrictions	3,000	4,000	4,000	4,000	2,000	4,000

Table 4-127. Wildlife Group Habitats and Big Game Winter Range within Areas Available for Potential Oil and Gas Development by Alternative (Acres)

Habitat	Alternative					
	I	II	III	IV	V	VI
Aspen	1,300	1,300	1,300	1,100	1,100	1,300
Canyonland	4,000	4,000	4,000	3,000	3,000	4,000
Duneland)	700	700	700	700	700	700
Grassland	211,000	220,000	217,000	215,000	209,000	217,000
Mountain Mahogany/ Mountain Shrub	11,000	11,000	11,000	5,000	5,000	11,000
Sagebrush Steppe	65,000	66,000	65,000	45,000	45,000	65,000
Big Game Winter Range	94,000	95,000	94,000	64,000	64,000	94,000

The analysis for leasable minerals was based primarily on the Reasonably Foreseeable Development Scenarios (RFDS) for oil and gas and geothermal resources developed by the Idaho BLM State Office (Appendices K and L). The RFDS for oil and gas development, estimates that approximately 60 to 90 acres of surface disturbance would likely to occur in the planning area if a five-well oil field were developed over the life of the plan. The RFDS is the same for all alternatives. Oil and gas development in the northeast part of the planning area would occur primarily in grassland habitat. Mule deer or pronghorn winter range is lacking in the northern portion of the planning area. Development of an oil or gas field in the southeastern area would directly reduce habitat for the sagebrush steppe and potentially the aspen

and mountain mahogany/mountain shrub groups depending on location and access routes. The southeastern part of the planning area also contains big game winter range.

Development of oil or gas would result in minor to moderate increases in route density at the local scale. The density of other infrastructure (oil and gas – storage tanks, pipeline, buildings, pumps, etc.; geothermal – buildings, pumps, power lines) would also increase. Indirect road impacts would likely be substantially wider for birds in the sagebrush steppe group (total width 660 feet - Ingelfinger and Anderson, 2004) or an additional 75 acres per mile of road. Increased traffic on roads would result in additional wildlife mortality due to collisions. Long-term human disturbance (e.g., noise from pumps, vehicle traffic) would continue for the entire life of the project. In Wyoming mule deer generally avoided areas within 1.7 to 2.3 miles of well pads, in areas which traditionally had high mule deer use prior to gas field development (Sawyer et al., 2006; Sawyer et al., 2009). The number of wells is expected to be substantially less in the planning area than in the Wyoming study area which may result in reduced displacement. Timing restrictions effective during exploration and construction, are less effective once the well pads are in production because of continued noise and human disturbance (Sawyer et al., 2006).

Saline water or water contaminated with petroleum would either be re-injected (preferred disposal method) or placed in lined evaporation ponds. Several special status bat species are known to drink from man-made water sources. Oil reserve or sludge pits associated with well drilling can be mistaken for ponds, causing mortality to bats trying to drink from them (O'Shea et al., 2001). Toxins can accumulate in bats eating insects contaminated by waste water stored in ponds (Luce and Keinhath, 2007). Effects of increased bat mortality are believed to be minor for bat species that occur in high densities. However, the loss of adult bats that occur in low densities potentially has a great impact on local populations (Luce and Keinhath, 2007). Ponds with suitable water quality could provide habitat for mosquitos increasing the incidence of West Nile virus mortality on some wildlife.

Depending on amount and location, effects of infrastructure and disturbance associated with oil and gas development would be minor to major at local scale in the short and long term. Effects of oil and gas infrastructure and disturbance would be negligible to minor at the land scape scale in the short and long term due to the small amount of expected development.

Geothermal. The area where the resource would more likely be developed is located in the northern half of the planning area. About 9,000 acres were classified as having high potential (near the Bruneau Valley) and 357,000 acres were classified as having moderate potential for geothermal energy development. Areas closed, open, and open with various limitations vary by alternative (Table 4-128). According to the RFDS for geothermal development between 185 and 230 acres of surface disturbance would likely occur in the planning area as a result of geothermal exploration and development over the life of the plan. The vast majority of habitat would be grassland in the area of moderate or better geothermal resources. Amounts of wildlife group habitat within geothermal development areas are listed in Table 4-129 for the areas more likely to be developed for geothermal resources. Locally road density and infrastructure would increase near the development sites increasing the amount of human disturbance.

Table 4-128. Acres with Medium or Higher Potential for Geothermal Resources

Category	Alternative					
	I	II	III	IV	V	VI
Open	327,000	349,000	349,000	331,000	335,000	309,000
Open No Surface Occupancy	17,000	13,000	9,000	17,000	17,000	17,000
Open- Seasonal Restrictions	7,000	0	0	8,000	2,000	31,000
Open- Seasonal and Controlled Surface Use Restrictions	6,000	0	0	6,000	2,000	29,000
Open – Controlled Surface Use	< 1,000	3,000	3,000	3,000	< 1,000	3,000
Total	**358,000**	**365,000**	**361,000**	**365,000**	**357,000**	**389,000**
Closed	14,000	1,000	5,000	8,000	12,000	5,000

Table 4-129. Wildlife Group Habitat and Big Game Winter Range within Areas of Potential Geothermal Development [A] by Alternative (Acres)

Habitat	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Aspen	0	0	0	0	0	0	0
Canyonland	500	500	500	500	500	500	500
Duneland	700	700	700	700	700	700	700
Grassland	337,000	351,000	347,000	347,000	329,000	340,000	347,000
Mountain Mahogany/ Mountain Shrub	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Sagebrush Steppe	10,000	11,000	11,000	11,000	11,000	11,000	11,000
Big Game Winter Range	6,000	9,000	9,000	6,000	7,000	8,000	8,000

[A] Medium and High potential.

Depending on amount and location, effects of infrastructure and disturbance associated with geothermal development would be minor to moderate at local scale in the short and long term. Impacts of geothermal development infrastructure and disturbance would be negligible to minor at the land scape scale in the short and long term due to the small amount of expected development.

Salable Minerals

Expansion of existing gravel pits would negligibly reduce or divide wildlife habitat because existing roads would be used. Gravel pits at new locations would usually require a short route to transport gravel from the pit location. New roads associated with new gravel or decorative rock sites would increase route density locally. Seasonal or temporal direction on operations (e.g., blasting, crushing) would help mitigate impacts of human disturbance to wildlife during important time periods.

Across the planning area acreage closed to salable minerals would vary from a low of 89,000 acres to a high of 241,000 acres. The maximum acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to 3,300 acres over the life of the plan. The location of the roads in relation to snake hibernacula would influence seasonal mortality of snakes (Jochimsen, 2006). The location of new roads for gravel pits may increase mortality of some reptiles at the local scale.

Impacts from Areas of Critical Environmental Concern Actions

The effects of Areas of Critical Environmental Concern (ACECs) management are related to their priority for wildland fire suppression, vegetation restoration, noxious weed treatment, and any other special management requirements or restrictions. Existing ACECs cover approximately 89,000 acres. Table 4-130 displays the amount of group habitat for each existing or nominated ACEC.

Table 4-130. Wildlife Group Habitat in Existing and Nominated Areas of Critical Environmental Concern

ACEC	Aspen (Acres)	Canyonland (Acres)	Grassland (Acres)	Mountain Mahogany/ Mountain Shrub (Acres)	Sagebrush Steppe (Acres)	Riparian (Miles)	Big Game Winter Range (Acres)
Bruneau-Jarbidge (Existing)	20	28,000	29,000	0	28,000	96	84,000
Bruneau-Jarbidge (Expanded)	20	31,000	44,000	30	47,000	107	120,000
Bruneau-Jarbidge (Reduced)	0	17,000	17,000	0	20,000	49	56,000

ACEC	Aspen (Acres)	Canyonland (Acres)	Grassland (Acres)	Mountain Mahogany/ Mountain Shrub (Acres)	Sagebrush Steppe (Acres)	Riparian (Miles)	Big Game Winter Range (Acres)
Inside Desert (Large)	0	0	45,000	0	27,000	0	73,000
Inside Desert (Small)	0	0	25,000	0	16,000	0	41,000
Jarbidge Foothills (Large)	2,500	3,500	29,000	16,000	82,000	41	134,000
Jarbidge Foothills (Small)	1,000	3,500	7,000	8,000	44,000	19	64,000
Lower Bruneau Canyon	0	110	910	0	30	< 1	1,000
Middle Snake	0	0	7,000	0	120	9	0
Sagebrush Sea	2,500	44,000	590,000	16,000	302,000	200	861,000
Salmon Falls Creek	0	2,300	300	0	100	31	0
Sandpoint (Existing)	0	0	810	0	0	1	0
Sandpoint (Expanded)	0	0	960	0	0	2	0
Upper Bruneau Canyon	0	5,000	7,500	0	5,000	14	18,000

The following indicators were used to analyze impacts from Areas of Critical Environmental Concern actions to wildlife habitat:

- Change in upland acres of wildlife group habitats and
- Acres with management emphasis (ACEC management, suppression priority, restoration priority, etc.).

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, three ACECs would be retained: Bruneau-Jarbidge, Salmon Falls Creek, and Sand Point. Topography, access and other constraints limit options to treat these annual areas within the current ACECs. In the uplands, restoration would reduce the amount and configuration of grassland habitat in the long term. Habitat restoration would increase patch size of sagebrush steppe and mountain mahogany/mountain shrub and decrease distance between habitat patches. Short-term impacts of restoration would be negligible at the local and planning area scales. Long-term restoration would have minor to moderate impacts at the local scale and minor impacts at the planning area scale which would benefit big game and wildlife in the mountain mahogany/mountain shrub and sagebrush steppe groups.

Bruneau-Jarbidge ACEC is to be managed to achieve and maintain habitat in good ecological condition. To meet this objective, mule deer and pronghorn habitat burned in the Murphy Complex Fires in the Bruneau-Jarbidge ACEC would be restored which would also benefit bighorn sheep using the adjacent upland plateaus. Roads leading to the 85,000 acre Bruneau-Jarbidge ACEC would not be upgraded and new roads would not be constructed to maintain the current low level of human disturbance. Fewer disturbances would generally be beneficial to bighorn, wintering big game, and some other wildlife. Closing the Sand Point ACEC to salable mineral development and mineral leasing would protect habitat for grassland and riparian group wildlife habitat. Management of the Salmon Falls Creek ACEC (3,000 acres) generally protects the majority of habitat from anthropogenic change. Access to the ACEC is primarily by foot from either Lilly Grade or Balanced Rock Park, which limits wildlife disturbance. The majority of wildlife in this ACEC are associated with the canyonland and riparian groups.

Impacts from Management Specific to Alternative I

Special management would be applied to over 97,000 acres in five ACECs. A total of 31,000 acres of canyonland, 38,000 acres of grassland, and 28,000 acres of sagebrush steppe group habitat would be within ACECs. Restoration (29,000 acres) would be a priority in the Bruneau-Jarbidge, Lower Bruneau Canyon, and Middle Snake ACECs. Restoration of sagebrush steppe and mountain mahogany/mountain shrub would also increase big game winter range. Impacts of restoration would be negligible to minor in the short term at the local and planning area scales. In the long term, impacts would be considered moderate at the local scale and minor at the planning area scale. Sagebrush steppe group would increase following restoration, whereas, the grassland group would be reduced.

Infrastructure (routes, power lines, fences, etc.) would not change in the ACECs due to special management limiting human disturbance. Restoration would become a higher priority in the Bruneau-Jarbidge ACEC speeding re-establishment of shrubland (28,000 acres) for big game and wildlife in the mountain mahogany/mountain shrub and sagebrush steppe groups. Habitat restoration in the Lower Bruneau Canyon ACEC would be a high priority and would improve approximately 700 acres of habitat primarily for wildlife in the sagebrush steppe group. Restoration of roughly 200 acres of habitat in the Middle Snake ACEC would enhance habitat for wildlife in the sagebrush steppe group. Effects would be negligible at both the local and planning area scale in the short term. In the long term, restoration of the Bruneau-Jarbidge ACEC would be moderate at the local and planning area scale. ACECs would be a priority for the control of noxious weeds and invasive plants which would help maintain habitat quality. ACECs would be in critical suppression areas, which may reduce future habitat change due to wildland fire.

All ACECs would be considered right-of-way (ROW) avoidance areas. Some ROWs for may be allowed to the extent they do not impact the relevant and important values of the ACEC. Human disturbance may increase due to maintenance of the ROW. ROW avoidance would minimize future habitat loss and fragmentation resulting from ground disturbance associated with ROWs. Oil and gas, geothermal, or other leasable mineral extraction in any of the ACECs would be allowed with no surface occupancy restrictions, limiting habitat fragmentation and human disturbance. Having an increased priority for restoration and invasive plant treatments would help maintain or improve habitat for wildlife long term.

Impacts from Management Specific to Alternative II

Alternative II would not designate any new ACECs and would remove special management from the three existing ACECs. Canyonland and riparian habitat in the Salmon Falls Creek and Bruneau-Jarbidge ACEC would have some continued protection where they overlap eligible Wild and Scenic Rivers (WSRs), designated wilderness and Wilderness Study Area (WSA). The portion not overlapping wilderness, WSR or WSA would likely see an increase in routes and infrastructure density and associated human disturbance.

Effects of no ACEC designation would be negligible in the short term at the local and planning area scale. Long term, the reduced suppression and restoration priority would likely result in more grassland habitat and less sagebrush steppe habitat. Impacts would be moderate at the local scale and minor at the planning area scale.

Impacts from Management Specific to Alternative III

ACECs would decline about 28,000 acres primarily from the Bruneau-Jarbidge ACEC. The remaining portion Bruneau-Jarbidge would overlap designated wilderness which limits restoration options. Vegetation Management Area D is a priority for restoration, but the focus is on treatments to protect sagebrush habitat not necessarily to expand sagebrush steppe or mountain mahogany/mountain shrub habitats. Less sagebrush steppe habitat, including big game winter range would be included in the reduced Bruneau-Jarbidge ACEC. Approximately 8,000 fewer acres of sagebrush steppe habitat would be within the Bruneau-Jarbidge ACEC than the No Action Alternative.

Impacts of management for both the Salmon Falls Creek and Sand Point ACECs would be the same as Alternative I. Areas formerly in the Bruneau-Jarbidge ACEC and not in Wilderness would likely see an increase in route and infrastructure density due reduced protections. ACECs would remain a priority for

suppression and noxious weed treatments which may help slow long-term loss of sagebrush steppe. Effects to wildlife in the sagebrush steppe and grassland groups would likely be negligible in the short term at both the local and planning area scales. Long term, the reduced area for restoration would decrease sagebrush steppe habitat and increase grassland habitat.

Impacts from Management Specific to Alternative IV

ACECs would be priorities for restoration. Restoration in portions of the Bruneau-Jarbidge, Inside Desert and Jarbidge Foothills ACEC would involve re-establishing primarily sagebrush steppe which would increase habitat for wildlife in the sagebrush steppe group, while reducing habitat for wildlife in the grassland group. Alternative IV-B would include approximately 54% less mountain mahogany/mountain shrub, 62% less aspen, and 33% less sagebrush steppe habitat than Alternative IV-A. The size of Jarbidge Foothills ACEC would be 136,000 acres in Alternative IV-A decreasing to 66,000 acres in Alternative IV-B. Less sagebrush steppe habitat would be restored in the Inside Desert area as a result of the smaller Inside Desert ACEC in Alternative IV-B. Shrub restoration on big game winter range within ACECs would be restored. Impacts would be negligible in the short term both locally and at the planning area scale. Impacts would be moderate or greater at the local scale and minor to moderate at the planning area scale, primarily due to restoration.

Some of the infrastructure within the Inside Desert ACEC would be removed reducing human disturbance needed to maintain the infrastructure. Fence removal would reduce bird mortality from colliding with fences locally. Removal of water troughs would somewhat shift wildlife distribution in the area, primarily pronghorn and mule deer, toward the Jarbidge or Clover Creek canyons or toward the foothills to the south. Because a number of troughs lack water during the summer the change in distribution would likely be minor at the land scape scale. Because infrastructure is reduced disturbance associated with maintenance would decline. Reduced long-term disturbance or displacement would likely be negligible locally and at the planning area scale.

Special management for ACECs includes increased priority for noxious weed treatments would maintain or improve habitat quality within the treated areas of the ACECs. Alternative IV provides that new salable minerals pits would be minimized within the ACECs. No leasable minerals are known to be present in the Bruneau-Jarbidge ACEC; however, portions of the potential oil and gas area overlap the Jarbidge Foothills ACEC. Development of oil or gas would reduce habitat locally as well as increase infrastructure density and human disturbance within the nominated Jarbidge Foothills ACEC. Locally impacts would be minor to moderate in the short term and at the negligible at the planning area scale. Long-term impacts would be minor to moderate at the local scale and negligible at the planning area scale.

Impacts from Management Specific to Alternative V

Special management makes restoration of habitat within the Sagebrush Sea ACEC a priority with a combination of active and passive techniques. In the long term, increased sagebrush steppe or mountain mahogany/mountain shrub would benefit wildlife in those groups as well as big game. Disturbance would temporarily displace some wildlife in areas actively restored. Displacement during active restoration would be minor at the local scale and negligible at the landscape scale in both the short and long term. Actively restored areas would recover more rapidly than natural recovery areas, increasing sagebrush steppe and mountain mahogany/mountain shrub habitats in the long term.

Because grazing would not be allowed in the three smaller ACECs (Lower Bruneau Canyon, Middle Snake, and Sandpoint) range infrastructure, to the extent it is present within these ACECs, would be removed. Routes associated with project maintenance would be reduced decreasing infrastructure and route density. Human disturbance and wildlife displacement associated with the maintenance of those projects would be eliminated. Some infrastructure would remain to facilitate livestock management in the Sagebrush Sea ACEC. Wildlife displacement due to the maintenance of the infrastructure would be negligible in the short term both locally and at the planning area scale. Long-term displacement would likely be negligible locally and at the planning area scale.

Three of the ACECs (Lower Bruneau Canyon, Middle Snake, and Sandpoint) would be closed to leasable and salable minerals and new land use authorizations. Extraction of salable minerals would be authorized

at limited levels in the Sagebrush Sea ACEC; however, direction emphasizes the expansion of existing salable mineral sources rather than developing new sources. Seasonal restrictions would mitigate disturbance impacts associated with blasting, crushing, and screening in at gravel pits. Impacts of salable minerals would be negligible at the local and planning area scales in the short and long terms.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate 22,000 acres as ACECs (Lower Bruneau Canyon, Salmon Falls Creek, Sand Point – expanded, Upper Bruneau Canyon). About 18,000 acres of the Upper Bruneau Canyon ACEC covers the portion of the Bruneau River Canyon and some adjoining uplands south of the designated wilderness. Accompanying the reduced acreage, less restoration would be within the ACECs. In the short term, restoration with the ACECs would be negligible at the local and planning area scale. Big game winter range in the Upper Bruneau Canyon ACEC would increase locally following successful restoration in the long term. Long-term restoration within ACECs would likely be moderate at the local scale and negligible at the planning area scale due to reduce ACEC area for treatment.

New routes and some types of infrastructure in the ACECs would likely be limited but not prohibited. Special management would preclude some types of infrastructure. This would help maintain the low density of infrastructure. New fences could be installed consistent with objectives specific to the ACEC.

ACECs would be a priority for restoration, wildland fire suppression, noxious weed and invasive plant treatments. Human disturbance and displacement of some wildlife would occur during treatments. Displacement impacts would be minor to negligible at the local and landscape scales in the short and long terms. Treatments would maintain or improve habitat quality at the local scale. Special management would minimize disturbance associated with salable or leasable minerals and land use authorizations.

Summary of Direct and Indirect Impacts

Table 4-131 displays the summary comparisons between alternatives.

Table 4-131. Summary Comparisons between Alternatives

Category	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Wildlife Comparisons								
Wildlife tracts (acres)	13,400	20,000	9,900	13,700	13,700		13,700	13,900
Estimated new fence for wildlife tracts (miles)	70	45	25	30	30		30	35
Vegetation Comparisons								
Vegetation Management Area (VMA) priority for restoration	NA	C & A	A & B	A & D	D & C		A & C	D & C
Desired future condition for shrubland (acres)	325,000	694,000	347,000	566,000	948,000		804,000	830,000
Desired future condition for grassland (acres)	998,000	630,000	977,000	738,000	376,000		520,000	493,000

Category	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Vegetation Comparisons								
Riparian zone at proper functioning condition (PFC; miles)	85	145	85	183	183		183	183
Wildland Fire and Fuels Comparisons								
VMA Fire suppression priority	NA	C & B	A & B	B & A	C & D		C & B	C & B
Area of Critical Environmental Concern (ACEC) suppression priorities (acres)	89,000	97,000	0	61,000	333,000	230,000	966,000	22,000
Amount of Fuel Breaks (acres)	NA	11,000	13,000	44,000	11,000		7,000	11,000
Suppression-related infrastructure	NA	4th Highest	3rd Highest	Highest	4th Highest		Least	2nd Highest
Aspen in critical suppression (acres)	2,500	600	400	600	2,500	1,300	2,500	600
Mountain mahogany/ mountain shrub in critical suppression (acres)	16,000	10,500	1,500	10,500	16,000	12,500	16,000	10,500
Sagebrush steppe in critical suppression (acres)	331,000	286,000	51,000	285,000	305,000	300,000	315,000	296,000
Riparian in critical suppression (miles)	316	214	87	168	251		303	199
Big game winter range in critical suppression (acres)	870,000	372,000	74,000	357,000	475,000	433,000	870,000	384,000
Livestock Grazing Comparisons								
Area available for grazing (acres)	1,412,000	1,389,000	1,408,000	1,407,000	1,324,000	1,355,000	1,160,000	1,406,000
Aspen closed (acres)	0	100	100	100	100		1,200	200

Category	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Livestock Grazing Comparisons								
Canyonland closed (acres)	28,000	33,000	32,000	33,000	33,000		36,000	32,000
Grassland closed (acres)	14,000	38,000	18,000	20,000	52,000		180,000	20,000
Mountain mahogany/ mountain shrub closed (acres)	< 100	200	< 100	400	400		9,000	200
Sagebrush steppe closed (acres)	6,000	12,000	8,000	8,000	26,000		76,000	7,000
Riparian closed (miles)	177	219	195	195	212		252	219
Big game winter range closed (acres)	32,000	45,000	36,000	37,000	117,000	86,000	214,000	38,000
High Animal Unit Months (AUMs) at full implementation	260,000	245,000	440,000	348,000	123,000	127,000	85,000	279,000
Estimated reference area fence (miles)	0	150	52	75	150		0	39
Expected change in range infrastructure	3rd Highest	4th Highest	Highest	2nd Highest	5th Highest		Least	3rd Highest
Estimated residual grass height (inches)	NA	4	< 4	4	7		> 7	4
Use in native pastures (%)	NA	30-40%	40-50%	30-40%	20-30%		10-20% & 20-30%	30-40%
Recreation Comparisons								
Special Recreation Management Areas and Extensive Recreation Management Areas with no new infrastructure (acres)	NA	284,000	2,000	2,000	151,000		2,000	284,000
Motorized SRMAs (acres)	3,000	36,000	0	34,000	34,000		3,000	35,000
Aspen in SRMA/ ERMAs (acres)	NA	2,500	0	0	100		0	2,500

Category	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Recreation Comparisons								
Canyonland in SRMA/ERMAs (acres)	NA	21,000	2,000	2,000	18,000		2,000	21,000
Mountain mahogany/ mountain shrub in SRMA/ ERMAs (acres)	NA	16,000	0	0	100		0	16,000
Sagebrush steppe in SRMA/ERMAs (acres)	NA	130,000	4,000	6,000	48,000		500	130,000
Riparian in SRMA/ERMAs (acres)	NA	122	16	18	58		7	122
Big game winter range in SRMA/ ERMAs (acres)	NA	288,000	6,500	6,500	155,000		2,000	287,000
Transportation and Travel Comparisons								
Open to motorized cross country travel (acres)	342,000	4,000	0	4,000	4,000		1,000	4,000
Closed to motorized (acres)	63,000	104,000	62,000	63,000	98,000		166,000	63,000
Travel Management Areas (TMAs) reducing route density (acres)	NA	663,000	0	0	1,337,000		1,368,000	135,000
Land Use Authorization Comparisons								
Right-of-Way (ROW) exclusion Area (acres)	62,000	63,000	62,000	63,000	100,000		167,000	63,000
Big game winter range in exclusion area (acres)	60,000	60,000	60,000	60,000	97,000		161,000	60,000
ROW corridor (acres)	29,000	53,000	53,000	53,000	53,000		53,000	43,000
Expected wind development marginal or better wind (acres)	111,000	39,000	127,000	50,000	37,000		31,000	22,000

Category	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Land Use Authorization Comparisons								
Big game winter range in expected wind energy area (acres)	68,000	7,000	84,000	18,000	5,000		0	0
Minerals Comparisons								
Locatable minerals withdrawn or recommended for withdrawal (acres)	60,000	129,000	87,000	88,000	143,000		93,000	60,000
Leasable minerals closed (acres)	63,000	151,000	62,000	79,000	242,000	210,000	183,000	95,000
Salable minerals closed (acres)	63,000	144,000	62,000	78,000	241,000	209,000	183,000	54,000
ACEC Comparisons								
ACECs (#)	3	5	3	5	5		4	4
ACEC (acres)	89,000	97,000	61,000	333,000	333,000	230,000	966,000	22,000

Impacts from the No Action Alternative

The wildlife tracts would retain their current configuration and acreage. Substantially more fence would be required to fence all tracts to maximize habitat management on tracts due to numerous 40 and 80 acre tracts within allotments. Small tract size would generally make management less efficient. The wildlife tracts would not necessarily be a priority for restoration.

Sagebrush steppe and mountain mahogany/mountain shrub habitats would continue to decrease while grassland habitat would increase due to a combination of factors. Restoration would not be a high priority (tied for least with Alternative II) and would be more closely tied to fuels projects including fuel breaks rather than large scale restoration focused on connecting sagebrush steppe habitat. About 68,000 acres of big game winter range lies within the expected wind energy development area. About 85 miles of riparian area would remain at PFC and would continue to move toward PFC in accordance with national policy for the remaining miles.

The entire planning area would remain a critical suppression area, limiting the effectiveness of having critical suppression areas. New infrastructure could be placed irrespective of presence of other disturbance. The portions of Twin Falls and Elmore Counties within the planning areas would remain open to cross-country motorized vehicle use. Route density would continue to increase because of newly created routes in these areas. Existing fuel breaks could be maintained. New routes, power lines, fences, pipelines would continue to increase, increasing infrastructure density and disturbance in big game winter range. The effects of concurrent livestock and big game use during severe winters are unknown. Existing ACEC management would continue to provide limited protection for big game winter range in areas where they overlap.

The No Action Alternative has the largest area available for livestock grazing, followed by Alternatives II, III, VI, I, IV, and V, in descending order. Alternative V would result in the tallest residual grass height, followed by Alternatives IV-A and IV-B. Residual grass heights would be similar in Alternatives I, III, and VI and would be least in Alternative II.

Overall, the No Action Alternative would be better than Alternative II for big game as well as for wildlife in the canyonland, riparian, mountain mahogany/mountain shrub, and sagebrush steppe groups. Maintenance of the acreage of non-native perennial grass seeding identified for each multiple use area would help retain substantial area for the grassland group, more than any other alternative. The No Action Alternative is least favorable for wildlife in the sagebrush steppe, mountain mahogany/mountain shrub, and riparian groups, but most favorable for wildlife in the grassland group in the long term. Continued management under the No Action Alternative would result in a minor beneficial impact to wildlife in the grassland and riparian groups and moderate adverse impacts to wildlife in the sagebrush steppe and mountain mahogany/mountain shrub groups. Adverse impacts would be related to wildland fire, land use authorizations and transportation and travel. Wildlife in the canyonland would continue to experience periodic minor adverse impacts from wildland fire and invasive species. Livestock use in aspen stands and mountain mahogany/mountain shrub would continue to reduce the understory in some areas.

Impacts from Alternative I

The wildlife tracts would be realigned and increased over 50% from 13,000 to about 20,000 acres, the most acreage in the alternatives. A new habitat management plan would be prepared outlining habitat improvement projects (planting shrubs and forbs, installing ponds or guzzlers, signs, etc.) and protective fencing. Increasing the tract size may reduce wildlife population sink affects associated with small areas.

Long-term restoration would more than double habitat for wildlife in the sagebrush steppe, while decreasing habitat for wildlife in the grassland group by about 34%. Habitat for the mountain mahogany/mountain shrub groups would increase to a lesser degree. The amount of riparian habitat at PFC would increase from 85 miles to 145 miles. Upland restoration in ACECs would improve approximately 29,000 acres of big game winter range that occurs in ACECs. Approximately 255,000 acres of winter range would be restored. About 7,000 acres of winter range would within the expected wind energy development.

About 11,000 acres (300 miles) of new fuel breaks and other new infrastructure to facilitate wildland fire suppression would be established. The miles of fuel breaks in Alternative I would be about 50% less than Alternative III and approximately 15% less than Alternative II. The amount of fuel breaks would be the same as Alternatives IV and VI and over 35% less more than Alternative V. Fuel breaks may reduce or split some of the existing shrubland. The critical suppression area would be 491,000 acres. Priority for suppression include: 97,500 acres in ACECs, about 286,000 acres of sagebrush steppe habitat, and 372,000 acres of big game winter range. Infrastructure density would increase as a result of land use authorizations, fencing reference areas, range projects, some fire/fuels projects, restoration projects, and wildlife projects. Alternatives I and IV would require the most new fence for reference areas, whereas Alternative V would require the least new fence. The Canyonlands and Jarbidge Foothills TMAs would reduce routes and increase core habitat size for wildlife in the sagebrush steppe group and big game. Although cross-country motorized vehicle use would be prohibited to the general public, cross-country motorized vehicles use would continue by various lease, ROW, and permit holders granted authorizations which would negate some of the route closures and possibly create new routes.

Estimated utilization levels would provide a mix of residual grass heights providing short and tall grass areas for birds with differing nesting requirements. Estimated utilization levels in native plant communities in Alternative I would be the same as Alternatives III and VI, more than Alternative II, but less than Alternatives IV and V.

Overall, management under this alternative would result in moderate beneficial impacts to wildlife in the mountain mahogany/mountain shrub, riparian, and sagebrush steppe groups in the long term. Minor beneficial impacts would occur to wildlife in the aspen and canyonland groups in the long term. There would be a moderate adverse impact to wildlife in the grassland group primarily due to long-term restoration of other habitats.

Impacts from Alternative II

Wildlife tracts would decline from 13,000 acres to a little less than 10,000 acres, most of the realignment would be from dropping many tracts within grazing allotments. Like Alternative I a new tracts plan would be developed. Restoration could occur on tracts, but would not be a high priority.

Restoration would have a focus of converting annual grass to non-native perennial grass communities, but does less restoration of shrublands. Big game winter range would not be a priority for restoration. Approximately 84,000 acres of big game winter range would lie within the expected wind energy development. Livestock grazing on big game winter range during the winter would likely increase due to increased AUMs and temporary non-renewable permits. Long term, there would be a decrease in sagebrush steppe, mountain mahogany/mountain shrub habitats and an increase in grassland habitat. In some areas treatments would be conducted to reduce shrubs to maintain abundant forage for livestock. Riparian habitat would maintain at 85 miles of PFC, with the remaining miles improving toward PFC.

The critical suppression area would include approximately 170,000 acres of which 51,000 acres are sagebrush steppe and 74,000 acres are big game winter range. New fuel breaks would total 350 miles. Habitat loss, as well as route and infrastructure density increase following construction of new roads, towers poles for land use authorizations, range projects, and other fuels and wildland fire suppression projects would occur. Infrastructure density for fire and land use authorizations would be highest in Alternative II. No ACECs would be designated. Special management for these areas would be dropped, except where they overlap wilderness, Wilderness Study Area, or Wild and Scenic River segments. Although travel would generally be limited to existing routes, route density would increase in TMAs to facilitate uses. Various permit holders would receive authorizations for motorized cross-country travel. The exemptions coupled with an emphasis on development would increase route density reducing habitat and dividing habitat patches in to smaller areas.

Alternative II would provide the most area short residual grass heights areas limiting nesting habitat for birds with somewhat different nesting requirements. New range infrastructure would be most in Alternative II to facilitate livestock management. Overall residual herbaceous cover would be the shortest of the alternatives.

Management from Alternative II would result in minor beneficial impacts to wildlife in the grassland group. Benefits to the grassland group would be partially offset by increased infrastructure and disturbance. Major adverse impacts to wildlife in the sagebrush steppe and mountain mahogany/mountain shrub groups would be expected long term. Impacts to wildlife in the aspen group would be moderate and adverse. Impacts to wildlife in the riparian group would be negligible. The canyonland group would experience minor adverse impacts in part due to lowered suppression priority. Alternative II would be the least favorable to mule deer and pronghorn due to the overall increase of infrastructure density associated with commodity uses.

Impacts from Alternative III

Wildlife tracts would be realigned and increase slightly compared to the No Action Alternative, but be less than Alternatives I and VI. Like Alternative I a new tract plan would be prepared and implemented to improve habitat for upland game. Realignment would increase average tract size and make management and restoration more efficient.

Alternative III would provide for more restoration of sagebrush steppe and mountain mahogany/mountain shrub habitats than the No Action Alternative or Alternative II, but less than the other action alternatives. Some of the fuel breaks would be positioned to protect shrubland areas and could divide and reduce shrublands. More big game winter range could be restored as part of restoration and fuels treatments. The impacts of winter grazing on big game winter range are expected to be similar to the No Action Alternative. Approximately 18,000 acres of big game winter range could be present in the wind energy development area. The miles of riparian area to achieve PFC would be 183 miles. The remaining riparian area would continue to be managed to improve toward PFC.

The critical suppression area includes approximately 476,000 acres of which 285,000 acres are sagebrush steppe and 357,000 acres are big game winter range. About 60,000 of the 61,000 acres of ACEC overlap wilderness so ACEC management would have limited additional benefits. Alternative III would include the largest number of miles of fuel breaks (600 miles) which would divide or reduce sagebrush steppe or mountain mahogany/mountain shrub habitats and be maintained as grassland in the short and long term. Unvegetated fuel breaks would reduce habitat wherever they were located. Infrastructure density would increase following the issuance of various land use authorizations, range projects, and fuels projects. Most existing and a few new routes would be maintained or improved to reduce wildland fire crew response time and to maintain fuels projects. No TMAs have a goal of reducing route density. Route density would increase in the TMA associated with motorized recreation.

Estimated utilization levels would provide a mix of residual grass heights providing short and tall grass areas for birds with somewhat different nesting requirements. Residual grass heights would be the second shortest of the alternatives after Alternative II.

Overall, Alternative III would result in minor to moderate beneficial impacts to wildlife in the mountain mahogany/mountain shrub, riparian, and sagebrush steppe groups in the long term due to restoration and enhanced wildland fire suppression. Minor beneficial impacts may occur to wildlife in the aspen and canyonland groups in the long term. Wildlife in the grassland group would experience minor to moderate adverse impacts in the long term as restored areas mature.

Impacts from Alternative IV

Effects of Alternative IV to the wildlife tracts would be similar to Alternative III. Tract configuration would be the same but the priority for restoration would be slightly higher.

Alternative IV would restore shrubland to achieve 948,000 acres (the most of all the alternatives) long term; the majority of the shrubland increase would be sagebrush steppe habitat. Big game winter range overlaps priority areas for restoration on 339,000 acres. About 5,000 acres of big game habitat would be within expected wind development areas. The impacts of winter grazing on big game winter range are expected to be similar to the No Action Alternative. As a result there would be a moderate to major decline in grassland group habitat at the planning area scale. The same as Alternative III, 183 miles of riparian area would achieve PFC, with the remainder improving toward PFC.

The critical suppression area includes approximately 593,000 acres of which 305,000 acres are sagebrush steppe in Alternative IV-A and 552,000 in Alternative IV-B of which 300,000 acres are sagebrush steppe. Alternative IV would create five ACECs totaling 333,000 acres in Alternative IV-A and 230,000 acres in Alternative IV-B. Overall, increases in infrastructure would be less than in the Alternatives I, II, and III because fewer AUMs would be authorized, four TMAs have objectives to reduce route density, and miles of fuel breaks decline. Route density would increase in the Deadman/Yahoo TMA (34,000 acres).

Estimated utilization levels would provide a mix of residual grass heights providing short and tall grass areas for birds with somewhat different nesting requirements. Residual grass heights would be the second tallest of the alternatives.

Like Alternative I a substantial amount of new fence would be required to protect references areas in Alternative IV. Overall, Alternative IV increases habitat for wildlife in the mountain mahogany/mountain shrub, riparian, and sagebrush steppe groups the most. However, it would decrease habitat for wildlife in the grassland group more than other alternatives. Big game winter range would increase indirectly through the restoration of shrubland habitats. Management under Alternative IV would result in major beneficial impacts to the wildlife in the mountain mahogany/mountain shrub, riparian, and sagebrush steppe groups in the long term due to restoration. Minor beneficial impacts would occur to wildlife in aspen and canyonland groups in the long term. There would be moderate adverse impacts to wildlife in the grassland group in the long term as grassland habitat becomes shrubland.

Impacts from Alternative V

Wildlife tracts in Alternative V would be the same configuration as in Alternative III but the priority for restoration would be increased.

Shrubland would increase from 366,000 acres to 804,000 acres (third among alternatives) in part due to restoration. Increases of browse on big game winter range would be less than Alternative IV due to reduced levels of active restoration. No big game winter range would be located in expected wind energy development areas. Livestock grazing would not be allowed in big game winter range during the winter.

The critical suppression areas include approximately 1,041,000 acres of which 315,000 acres are sagebrush steppe and 870,000 acres are big game winter range in Alternative V. Fuel breaks would total 200 miles. Similar to the No Action Alternative the large size of the critical suppression area would reduce its effectiveness regarding setting priorities during multiple wildland fires. Alternative V would increase the ACEC acreage to approximately 966,000 acres, the most of any alternatives. The least amount of new infrastructure would be needed, because of the reduced amount of new fuel breaks, no new fence would be needed for reference areas because they would be pasture sized, route reduction would be a goal on all but 3,000 acres, and the largest areas would be closed to development. Alternative V would be the only alternative to not grant exemptions to permit or ROW holders authorizing cross-country motorized travel, minimizing the creation of new routes. A small reduction in some range infrastructure may occur because of pasture sized reference areas and reduced AUMs. This would be offset by new fence to protect resources on wildlife tracts.

Alternative V would have the lowest estimated utilization levels of any of the alternatives. Tall grass habitat would be most in Alternative V. Short grass habitat would be generally limited to areas near water troughs or areas dominated by Sandberg's bluegrass. Alternative V would have the tallest residual herbaceous cover.

Overall, management in Alternative V would result in minor to moderate beneficial impacts to wildlife in the mountain mahogany/mountain shrub, riparian, and sagebrush steppe groups in the long term. Minor beneficial impacts would occur to wildlife in the aspen and canyonland groups in the long term. To the extent that natural recovery and limited restoration are successful; grassland habitat would incur a minor to moderate decrease in the long term at the planning area scale.

Impacts from Alternative VI (Proposed RMP)

Wildlife tracts would include 3,500 acres more than Alternative II and 400 acres than Alternatives III, IV, and V, but less than Alternatives I and VI. Wildlife tracts would be a priority for restoration. Overall effects would be the similar to Alternative III.

Restoration would increase shrubland to a total of 830,000 acres, the second most of the alternatives. About 8,000 acres of winter range in ACECs would be a high priority for restoration. Another 300,000 acres of winter range would be included in other restoration projects. Wind energy development could occur on 127,000 acres if stipulations are met. Riparian areas would be managed to have 183 miles at PFC, the same as Alternatives III, IV, and V.

The critical suppression area would include approximately 597,000 acres of which 296,000 acres are sagebrush steppe and 384,000 acres are big game winter range in Alternative VI. Fuel breaks would total 300 miles. ACECs would total 22,000 acres, none of which would overlap with designated wilderness. Infrastructure would increase to create fuel breaks, protect reference areas, wildlife tracts, resources or alter livestock distribution; and provide for land use authorizations. One TMA has a focus on reducing route density on roughly 135,000 acres. Route density would remain relatively constant in the remaining TMAs covering 1,202,000 acres. Route density is expected to increase in the TMA generally associated with motorized recreation.

Estimated utilization levels would provide a mix of residual grass heights providing short and tall grass areas for birds with somewhat different nesting requirements. Residual grass heights would be the third shortest of the alternatives.

Overall, management under this alternative would result in moderate beneficial impacts to wildlife in the mountain mahogany/mountain shrub and sagebrush steppe groups in the long term. Moderate benefits would occur in habitat for the riparian group in the long term. Minor beneficial impacts would occur to wildlife in the aspen and canyonland groups in the long term. There would be a moderate adverse impact to the grassland group primarily due to long-term maturation of restored sagebrush steppe and mountain mahogany/mountain shrub habitats.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impacts analysis area for general wildlife includes the planning area and an area 20 miles, east, south and west of the planning area (4,500,000 acres). This area was chosen for analysis to encompass general wildlife movements and movements of wintering big game. Since migratory birds and some bats move hundreds to thousands of miles between breeding areas and wintering areas the extent of impacts from actions in these distant areas on species which breed or winter in the area are unknown.

Past, present and reasonably foreseeable actions for the cumulative impact analysis focused primarily on the following:

- Military use,
- Upland Vegetation,
- Wildland Fire,
- Livestock Grazing,
- Transportation and Travel, and
- Land Use Authorizations.

The following ownerships were considered in the cumulative impacts analysis: Air Force, BLM, Forest Service, Idaho Department of Lands, and private land.

The following indicator was used for the cumulative impacts analysis for wildlife:

- Acres with management emphasis.

Military Use

Air space (Military operating areas) associated with Mountain Home Air Force Base extend from southwestern Idaho into southeastern Oregon and northern Nevada. The Saylor Creek and Juniper Butte Training Ranges lie within the planning area and are operated by the Air Force. A variety of infrastructure is associated with the training ranges including roads, power lines, fences, buildings, and various targets. Training exercises occur throughout the year. Aircraft fly at varying heights during training depending on the military operating area restriction, but when approaching targets aircraft are usually close to the ground. Above 10,000 feet supersonic flights cause sonic booms. The military operating area increases noise from jet flights and related training disturbance (e.g. vehicles, emitters) within the cumulative impacts analysis area.

A variety of factors influence noise including: distance, aircraft height above ground, type of aircraft, speed, topography, vegetation, and weather. Although jets flying near the ground are loud, typically the noise is short duration. In Arizona mule deer responded to simulated aircraft noise with elevated heart rates and modified (alarmed) behavior (Weisenberger et al., 1996). Weisenberger and others (1996) reported heart rates returned to normal within three minutes and the original behavior resumed within five minutes. Mule deer responses to simulated aircraft noise decreased with repeated exposure which Weisenberger and others (1996) hypothesized represented habituation. Free ranging pronghorn selected areas with the lowest sound pressure levels and avoided areas with the highest sound pressure levels (Landon et al., 2003). Pronghorn on Saylor Creek Training Range have apparently adapted to the noise and activity associated with military aircraft training including the use of training munitions. At times the Air Force suspends training to remove pronghorn from target locations (USAF, 2007b).

Golden eagles were generally unresponsive to civilian and military Apache helicopters in northern Utah (Grubb et al., 2010) which may have been influenced by topography, habituation, or other factors. The influence of jet aircraft noise on reptiles, mammals, songbirds, raptors, and waterfowl in the cumulative impacts area are unknown. In the cumulative impacts area these species have likely habituated to military jet aircraft training which has been ongoing for several decades.

Land Use Plans

The Burley Field Office operates under the Twin Falls Management Framework Plan. The Bruneau Field Office operates under the Bruneau Management Framework Plan. Both field offices are scheduled to begin land use planning in the next three years. The Wells (NV) Field Office operates under the Wells RMP. It also is scheduled to start a new land use plan in the next three years. Changes which limit transportation and travel to designated routes could reduce habitat fragmentation and loss. If new Areas of Critical Environmental Concern (ACECs) are created in the new land use plans special management should benefit wildlife. A variety of special management areas would likely be created in new land use plans.

Upland Vegetation

Large portions of the Saylor Creek Training Range burned in wildland fires and are now grassland. Outside the exclusive use area the Air Force seeded forage kochia in strips to function as fuel breaks and reduce the fine fuel load. The Berger Tract portion of the Burley Field Office were planted to crested wheatgrass decades ago when the land came back into Federal ownership. Sagebrush was reduced and crested wheatgrass was on tens of thousands of acres to increase livestock forage from the 1950s into the 1980s. Since the 1970s, tens of thousands of acres of crested wheatgrass were also planted following wildland fires in the Bruneau, Burley, Jarbidge, and Wells (NV) Field Offices to stabilize soils. At this time some land use plans direct management to maintain a certain acreage as crest wheatgrass seedings

Management of vegetation on State and private land is variable. State lands may or may not be seeded following wildland fire. Usually if State lands were treated, they were seeded to crested wheatgrass. In some instances, Idaho Department of Fish and Game help provide seed for Snake River wheatgrass and forbs. Ranches frequently farm or irrigate meadows for forage and manage uplands as rangeland. The rangeland has been burned by some ranchers to reduce sagebrush and increase grass. Farm land is usually planted to crops which vary between years. In some cases farm land has been seeded to grass as pasture or enrolled in the Conservation Reserve Program.

Wildland Fire

The Air Force maintains an approximately 100 foot wide unvegetated buffer strip around the inside of the exclusive use area on the Saylor Creek Training Range. The strip is disked multiple times annually to prevent the establishment of cheatgrass and other annual species to minimize infrequent wildland fires ignited by training from escaping the exclusive use area. The Air Force has personnel or contractors to help suppress wildland fires which start on training ranges. The Air Force has an agreement with the BLM to station a BLM fire crew at the Juniper Butte Training Range during parts of the summer to reduce travel time to suppress wildland fires.

The Twin Falls BLM district has agreements with Boise and Elko BLM districts to provide wildland fire suppression response to help reduce wildland fire size. Suppression agreements are also in place with some rural communities. In the late 1980s and early 1990s the Jarbidge Field Office installed a number of greens strips to reduce wildland fire size. The fuels program is currently restoring sagebrush and other shrubs into large burned areas lacking sagebrush in the planning area to establish a seed source.

Although not a planned action wildland fire has altered the most habitat within the cumulative impact analysis area. Wildland fires have burned over 1,670,000 acres (37%) within the cumulative impact analysis area since 1987. The cumulative impact analysis area includes 1,705,000 acres of big game winter range. Of this 861,000 acres (50%) have burned since 1987. Because only portions of adjoining administrative areas lie within the cumulative impacts analysis area, the acreage and percent burned listed in the table below does not reflect the amount of big game winter range or big game winter range burned in each entire administrative area. For example, 94% of big game winter range in the Mountain

City Ranger District within the cumulative impacts analysis area burned in wildland fires since 1987. This does not mean 94% of the entire Mountain City Range District burned since 1987.

Table 4-132. Big Game Winter Range and Winter Range Burned from 1987 – 2011 within the Planning Area and Cumulative Impacts Analysis Area

Administrative Area	Big Game Winter Range (Acres)	Winter Range Burned (Acres)	Percent Burned
Bruneau Field Office	66,000	18,000	27
Burley Field Office	74,000	15,000	20
Four Rivers Field Office	500	0	0
Jarbidge Field Office	905,000	575,000	64
Wells Field Office	133,000	35,000	26
Jarbidge Ranger District	43,000	17,000	40
Mountain City Ranger District	52,000	49,000	94
Cassia Unit, Sawtooth National Forest	13,000	4,500	35
Military, State, and Private Lands	418,000	147,000	35
Total	**1,705,000**	**861,000**	**50**

Livestock Grazing

The BLM and Forest Service have authorized livestock on public lands within the cumulative impacts analysis area since they were created. Classes of livestock grazed include cattle, sheep, and horses. Cattle are most frequently grazed. Fences usually form allotment and pasture boundaries. Livestock grazing is expected to continue at some level on public lands over the life of the plan. Livestock are grazed on most State lands in the cumulative impacts area. Livestock are grazed on most ranches and some of the farms in the area.

Transportation and Travel

Paved roads accessing public lands include US Highway 93, Idaho Highway 51, Rock Creek Road, and the Rogerson Highway to Murphy Hot Springs. Numerous county roads are paved in Cassia, Elmore, Owyhee, and Twin Falls Counties in Idaho, and Elko County in Nevada. Paved roads are more abundant near more populated areas. More rural areas are often served by graveled roads maintained by counties and highway districts. The portions of the Burley, Bruneau and Wells Field Offices open to motorized cross-country vehicles encourages the creation of new routes which can divide and damage habitats and contribute to the spread noxious weeds and invasive plants.

Land Use Authorizations

Within the cumulative impacts area, rights-of-way (ROWs) are issued for roads and utilities by the BLM and Forest Service. Utility ROWs may include electrical distribution and transmission lines, fiber optic cables, oil/gas pipelines and communications sites. The State of Idaho also issues ROWs or easements for a variety of land uses. In a few areas south of the Snake River wind energy has been developed on private land. Communications sites are located on some private lands. Within the cumulative impacts area utility ROW corridors are in the process of being evaluated include Southwest Intertie Project and Gateway. Designating the corridors would increase infrastructure and routes for construction and maintenance within the corridors.

Minerals

BLM, State, and private lands authorize gravel pits, the most common mineral excavated within the cumulative impacts analysis area. Gravel pits are frequently small less than 40 acres. Gravel pits would be expected to be used until the gravel seams are depleted. Use of the existing gravel pits would likely continue until the gravel seam is depleted. Gravel pits reduce habitat and disturbance associated with

crushing, screening, and loading temporarily likely displaces some wildlife. Gravel pits frequently have glass, cans or other debris left by target shooters.

ACECs

The Salmon Falls Creek ACEC is shared with the Burley Field Office and has been since the ACEC was designated in 1989. The ACEC is an avoidance area for overhead, surface or underground utilities and closed to motorized vehicles protecting wildlife habitat within the canyon for both field offices.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

None of the alternatives would restrict military uses of the air space or training ranges. The No Action Alternative would result in continued loss of sagebrush steppe and mountain mahogany/mountain shrub group habitats from large wildland fires. Establishing shrubs in winter range would continue at the present rate. Livestock grazing would continue on Federal, State, and private land. Changes in animal unit months (AUMs) in some multiple use areas may result in additional fencing or water developments. Portions of the planning area would remain open to cross-country motorized and mechanized travel. New routes would likely be created into the Wells (NV) Field Office and perhaps the Jarbidge Ranger District. The BLM would continue to issue or deny land use authorizations which could impact some developments, such as communications sites or renewable energy, on State and private land. Southwest Intertie Project (SWIP) and Gateway corridors would be finalized. Salable mineral use would increase to some extent. Should the discovery of gas or oil within the planning area occur, it would result in increased exploration in and adjacent to the planning area.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration would benefit wildlife in the sagebrush steppe, mountain shrub/mountain mahogany, and riparian groups. It is not known if restoration would keep pace with the conversion of sagebrush steppe to grassland. Wildland fire, long restoration periods, and increased infrastructure density make it unlikely there would be an increase in amount of sagebrush steppe habitat.

Cumulative Impacts from Alternative I

Alternative I would better focus wildland fire suppression and restoration (ACECs and Vegetation Management Area [VMA] C) efforts within the planning area. Alternative I would establish shrubs in big game winter range. Livestock grazing would continue on Federal, State, and private land. Changes in AUMs may result in additional fencing or water developments to alter livestock distribution. Little of the planning area would remain open to cross-country motorized and mechanized travel. It would be less likely that new routes would join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would continue to issue or deny land use authorizations which could impact some developments, such as communications sites or renewable energy, on State and private land. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to some extent. Impacts of oil or gas discovery would be the same as the No Action Alternative.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration would benefit wildlife in the sagebrush steppe, mountain shrub/mountain mahogany, and riparian groups. It is not known if restoration would keep pace with the conversion of sagebrush steppe to grassland. Wildland fire, long restoration periods, and increased infrastructure density make it unlikely there would be an increase in amount of big game winter range or sagebrush steppe habitat.

Cumulative Impacts from Alternative II

Alternative II would focus wildland fire suppression in VMAs A and B and restoration generally away from sagebrush steppe habitats. A suppression focus in VMA B would help protect some of the drier sagebrush steppe habitat. The amount of sagebrush steppe protected would be negligible at the planning area scale. Establishing shrubs would have a reduced priority compared to other alternatives. Livestock grazing would continue on Federal, State, and private land. A large increase in AUMs would likely result

in additional fencing or water developments to alter livestock distribution. The increase in AUMs may result in higher livestock numbers on State and private land. None of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations thereby increasing impacts to wildlife species and their habitat. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Exploration and development for oil and gas would be least restrictive in Alternative II. Impacts of gas or oil discovery to adjacent field offices would be similar to the No Action Alternative.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas probably would not keep pace with habitat loss for wildlife in the sagebrush steppe group. Wildland fire and the greatest increased infrastructure density would likely decrease the amount of habitat for big game and wildlife in the sagebrush group.

Cumulative Impacts from Alternative III

Alternative III would focus wildland fire suppression in VMA B and restoration in VMA D. Livestock grazing would continue on Federal, State, and private land. The second highest increase in AUMs would likely result in additional fencing or water developments to alter livestock distribution. Only 4,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations thereby increasing impacts to special status wildlife species and their habitat. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Like Alternative II exploration and development for oil and gas would be minimally restrictive in Alternative III. Impacts of gas or oil discovery to adjacent field offices would be similar to the No Action Alternative.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas probably would not keep pace with habitat loss for wildlife in the sagebrush steppe group. Wildland fire and the second highest increase of infrastructure density would likely decrease the amount of habitat for big game and wildlife in the sagebrush group.

Cumulative Impacts from Alternative IV

Alternative IV would focus wildland fire suppression in VMA C. Establishing shrubs in be a priority in ACECs and VMAs D and C. Livestock grazing would continue on Federal, State, and private land. The decrease in AUMs would likely result in additional fencing or water developments on State land so State leases could use all the State permitted AUMs on State land. Some small permit holders may sell out. Ranches with sagebrush may burn sagebrush and plant grasses to maintain economic viability. Grazing infrastructure in the Inside Desert ACEC would be reduced. Only 4,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations reducing impacts to potential developments on State and private land. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Alternative IV would close some areas in the southeastern part of the planning areas to exploration and development for oil and gas. Outside the closed areas seasonal restrictions would apply. If gas or oil were discovered within the planning area it could result in increased exploration in and adjacent to the planning areas.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Infrastructure would likely decrease in a few localized areas. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas would probably out pace

habitat loss. Active restoration and only slightly increased infrastructure density would likely increase the amount of habitat for big game and wildlife in the sagebrush group.

Cumulative Impacts from Alternative V

Alternative V would focus wildland fire suppression in VMAs C and B. Establishing shrubs would be a priority in ACECs and VMA C. Livestock grazing would continue on Federal, State, and private land. Alternative V would have the lowest level of AUMs for livestock. Only 1,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations reducing impacts to potential developments on State and private land. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Exploration and development for oil and gas would be less restrictive than Alternative IV. Should the discovery of gas or oil within the planning area occur, it would result in increased exploration in and adjacent to the planning area.

Increases in power lines, renewable energy, fences, pipelines, etc. would be minimal, maintaining or reducing infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas probably would not keep pace with habitat loss. Continued wildland fire would likely decrease the amount of habitat for big game and wildlife in the sagebrush steppe group.

Cumulative Impacts from Alternative VI (Proposed RMP)

Alternative VI would focus fir wildland fire e suppression in VMA C and B. Establishing shrubs would be a priority in ACECs and VMAs D and C. Livestock grazing would continue on Federal, State, and private land. The fourth highest increase in AUMs would likely result in additional fencing or water developments to alter livestock distribution. Only 4,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations reducing impacts to potential developments on State and private land. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Alternative VI would have the smallest area open to the exploration and development for oil and gas, but most of the planning area would be available with seasonal restrictions. Should the discovery of gas or oil within the planning area occur, it would result in increased exploration in and adjacent to the planning area.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance in some areas. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas may keep pace or exceed habitat loss. Wildland fires, active restoration, and increased infrastructure density would likely increase the amount of habitat for big game and wildlife in the sagebrush steppe group.

4.3.7. Special Status Species

4.3.7.1. Special Status Plants

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to special status plants:

- **Potential for impact to plants or populations** – Management actions prescribed in the alternatives might result in changes in the number of individuals and populations.
- **Potential for impact to occupied or potential habitat** – Data for special status plants include the number of individuals at a given population or the number of populations within a geographic area. However, these metrics might not be fully representative of current or potential species status under a

range of alternatives at a landscape scale. Numbers of individuals and even populations can be variable from year to year, particularly for annual species. Therefore, management actions with landscape-level effects were assessed based on potential to increase or decreased occupied or potential habitat.

- **Potential for impact to seed banks** – Some species, particularly annuals, might not be present from year to year. These species rely on seed banks for long-term maintenance of populations during periods not favorable to survival of plants (Meyer et al., 2005, 2006; Nunney, 2002). Therefore, some actions were assessed for ability to maintain seed banks in the light of short- and long-term impacts to existing and potential habitats.

Methods and Assumptions

Impacts to special status plants from management in the following sections of Chapter 2 were analyzed in detail: *Special Status Species*, *Upland Vegetation*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Transportation and Travel*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for special status plants. Impacts from management for special status plants can be found under *Impacts from Special Status Species* in the *Tribal Rights and Interests*, *Livestock Grazing*, *Transportation and Travel*, *Land Use Authorizations,* and *Leasable Minerals* sections.

Special status plants considered in this analysis are those listed under the Endangered Species Act (ESA) as Threatened or Endangered or plants that are Candidates or Proposed for listing under the ESA (Idaho BLM Type 1; see the *Special Status Plants* section of Chapter 3); or those taxa that are designated by the Idaho BLM State Director as Sensitive (Idaho BLM Types 2 to 4) pursuant to BLM Manual 6840 – Special Status Species Management. Watch species (Idaho BLM Type 5) are mentioned in this analysis; however, this is not a protective designation under BLM policy.

Actions were assessed to determine if there would be direct or indirect impacts to special status plant populations or habitats. Assessment was based on location of potential impacts within specific geographic areas or vegetation sub-groups (VSGs) relative to known special status plant populations or potential habitats.

The following species were grouped into the Desert Annual Group for analysis purposes: Alkali cleomella, desert pincushion, rigid threadbush, spreading gilia, white eatonella, and white-margin waxplant. All of these species occur in salt desert shrub and/or Wyoming big sagebrush communities at low elevations. Occurrence of these annual plants can be highly variable from year to year and short in duration. Therefore, management actions are assessed relative to their impact to potential habitats and seed banks.

Direct impacts to special status plants include the physical disruption or removal of rooted plants or their seed bank or disruption of habitat occupied by plants. Physical disruption includes consumption by animals, crushing of vegetative parts (e.g., stems, roots, leaves) and reproductive parts (e.g., flowers, fruits, seeds), and chemical treatment resulting in death of the plant or failure of the plant to reproduce.

Indirect impacts include reduction or loss of suitable habitat resulting from soil surface disturbance; soil compaction; loss in topsoil due to erosion; changes in soil chemistry; changes in soil food webs; deposit of eroded soil into slickspots; disruption of hydrological processes; plant community changes such as modification of species composition and structure, including overstory, understory, and biological soil crusts; introduction and spread of noxious weeds or invasive plants; and disruption, reduction, or elimination of pollinator populations.

Slickspot peppergrass populations are generally healthy with good population vigor when the plant community which they occur in is a high quality native community. A high quality native plant community provides for the needs of the slickspot peppergrass resulting in a vigorous and stable population. A high quality native plant community has no or few invasive plants or introduced species which compete for nutrients, water, and light. Low levels of ground disturbance, high biological crust density and bare ground

would also indicate a high quality community. A rich and diverse native forb component is a necessary component of a high quality native community for slickspot peppergrass which requires a pollinator.

Assumptions used in this analysis are:

- The effects to special status plants are a subset of the effects to the plant community as a whole. The effects to special status plants can be qualified in terms of the effects to occupied or potential habitats.
- In general, native plant communities are more likely to support habitat for special status plants than annual, non-native perennial, or non-native understory communities.
- Special status plants would be managed according to existing law, regulation, and policy.
- Special status designation of any plant according to law, regulation, or policy is dynamic. This analysis considers current status of specially designated plants. Implementation of actions contained within the final plan would require consideration of plants with special status designation at that point in time. Because of the dynamic nature of special status designation, effects of management actions are sometimes discussed in general terms rather than for specific species.
- Conservation measures outlined in conservation plans, strategies, and agreements for special status species (Appendix E) would be followed.
- For analysis purposes, it is assumed that vegetation treatments would occur within the first 10 years of RMP implementation. Desired plant species composition and structure typically would occur within 15 to 20 years following restoration treatments intended to move areas towards the Native Shrubland VSG.
- With active management, adequate ground cover for site stabilization would occur within two to five years following surface-disturbing activities.
- All vegetation treatments would result in attainment of the stated objectives. Failed or partially-failed treatments would be identified through monitoring and re-treated utilizing adaptive management methods until the objectives are met.
- Since wildland fire is an episodic event, it is assumed that untreated native vegetation as well as treated areas would burn over the life of the plan. It is assumed that areas identified as critical suppression areas would be less likely to burn and that, should a wildland fire occur, fire size would be smaller than for conditional suppression areas. It is also assumed that areas identified in conditional suppression areas would be more likely to burn.
- Cultivars of native species would be considered native. Communities dominated by native cultivars would be classified in the Native Grassland or Native Shrubland VSGs. In general, these communities would be expected to emulate native communities with respect to structural qualities and ecosystem processes.
- Noxious weeds and invasive plants would continue to be introduced into upland vegetation communities as a result of land uses and wildlife movements.
- Yearly climatic variability would influence the health and productivity of vegetation communities, but would be a common influence regardless of alternative.
- Natural successional processes would continue to occur in native plant communities over the life of the plan. For analysis purposes, natural processes are assumed to be consistent for all alternatives and are not accounted for here. All change represented in the analysis is assumed to be due to prescriptions described in the alternative's actions.
- The degree of impact attributed to actions would be influenced by multiple factors including, but not limited to, current vegetation type and condition; the type, seasonal timing, and degree of disturbance; yearly climatic variability including temperature and precipitation; and other mitigating or constraining actions.
- Impacts that result from management actions, authorizations, or allocations that result in surface disturbance are assumed to occur in proportion to the area affected.

Direct and Indirect Impacts

Impacts from Special Status Species Actions

The following indicators were used to analyze the impacts of Special Status Species actions on special status plants:

- Potential for impact to plants or populations,
- Potential for impact to occupied or potential habitat , and
- Potential for impact to seed banks.

Impacts from Management Specific to the No Action Alternative

Management actions under the No Action Alternative are generally protective in nature and provide specific direction for consideration and protection of special status plants during project and livestock grazing management. These actions would have the effect of protecting and maintaining known special status plant populations.

Management actions directing the improvement of sage-grouse nesting habitat in multiple use area 10 through seeding and rehabilitation would have long-term impacts to known populations or potential habitat for special status plants in the Desert Annual Group due to disturbance associated with sagebrush removal using prescribed fire or mechanical means. These actions would thin dense (greater than 30%) sagebrush canopies and create small-scale (1 to 10 acres), irregular openings. Thinning the sagebrush canopy would result in the reduction of shading and competition from sagebrush. However, this would increase potential for introduction or increase of invasive plants such as cheatgrass and, thus, competition with special status annual plants. Seeding using mixtures of grasses, forbs, and shrubs that benefit sage-grouse would result in short-term soil surface disturbance that would disrupt seed banks of annual special status plants. However, this action would also result in long-term habitat improvement through establishment of a more natural community structure and reduction of competition from invasive annual plants.

Actions that protect populations and habitat for bighorn sheep including restrictions on water developments, human uses, adverse habitat alteration, occupancy for oil and gas development, and conversion from cattle to sheep would generally protect special status plant populations and potential habitat that occur in bighorn sheep habitat including Cusick's primrose, Davis peppergrass, and spine-node milkvetch. Management actions protecting special status species in riparian areas, wetlands, and streams would provide general protection for potential habitat for American wood sage and chatterbox orchid.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Management common to the No Action Alternative and all action alternatives provides direction to follow conservation measures in biological opinions, letters of concurrence, conservation agreements, or candidate conservation agreements, which would be updated, revised, or replaced through future consultation with the US Fish and Wildlife Service. This action currently applies to slickspot peppergrass and would have the effect of providing consistent and current protective management for populations and habitat. The Conservation Agreement for Slickspot Peppergrass (Appendix E) provides overall direction for ongoing land use plan programs to avoid or minimize direct and indirect impacts to the habitat of slickspot peppergrass and restoration and maintenance of habitat. Conservation measures and implementation actions for slickspot peppergrass include conducting species inventories, exchanging location information with agency partners, completing site-specific Section 7 conferance on both ongoing and new actions, and avoiding or minimizing potential adverse impacts of site-specific projects covered under land use plan programs.

Impacts from Management Common to All Action Alternatives

Actions common to all action alternatives for special status species define species that would be protected. Management actions for monitoring and adaptive management would drive proactive protection and program development for special status plants. Specific direction for avoidance of special status species for activities related to leasable and salable mineral development, new communication

sites, and right-of-way construction and maintenance activities would reduce the potential for direct disturbance of populations or habitat. Allowing activities to occur, even with mitigation for adverse effects, would still result in destruction of special status plants, populations, seed banks, or habitats in localized areas. This is due to the fact that special status plants and their seed banks are not always detected prior to ground disturbing activities. This would result in long-term changes in distributions of special status plants and their habitats.

Actions for special status species in upland areas and riparian habitats would generally protect special status plants through direction to maintain and improve habitats and minimizing direct disturbance to populations and habitats. Actions specific to special status terrestrial and aquatic animals would tend to indirectly protect special status plants by minimizing impacts to habitat. Short-term disturbance of potential habitats or seed banks would result from habitat improvement projects, particularly those that result in soil surface disturbance (e.g., seeding), but would also expand suitable habitats through long-term establishment of a more natural community structure and reduction of competition from invasive annual plants.

Impacts from Management Specific to Alternative I

Actions for special status species management in Alternative I would generally maintain or improve the status of special status plants and their habitats. Specific actions include adjustment of livestock management and type and location of range infrastructure and other facilities. Modifications in livestock management would reduce intensity or timing of use so that impacts to special status plants would be decreased or eliminated. This would include avoiding use during critical periods for growth, flowering, and seed set to allow persistence of existing plants and perpetuation of seed banks.

Identification and monitoring of special status plant pollinators would provide information to guide activities that would indirectly affect special status plants, including chemical control of insect pests (e.g., grasshoppers, Mormon crickets). Direction to re-introduce special status plants, where practical, into historical but currently unoccupied habitat would increase the number of populations or individuals in existing populations and would eventually lead to the lack of need for special management.

Direction to maintain or improve sage-grouse and other special status species habitat would have long-term indirect effects for special status plants, particularly those that occur in sagebrush habitats. Maintenance of existing native shrubland communities would generally protect habitats for special status plants dependent on those habitats. Restoration projects in annual, non-native perennial, or non-native understory communities would result in disturbance by treatments, including chemicals or seeding, to special status plants or their seed banks. Conversion of these communities to native shrubland would result in long-term habitat improvement and expansion of potential habitat. The addition of forbs to existing native shrubland communities would indirectly affect special status plants through increases in food and habitat availability for pollinators, thus potentially increasing and diversifying pollinator populations.

Actions that protect populations and habitat for bighorn sheep, including restrictions on water developments, fences, sheep trailing, and conversion from cattle to sheep, would generally protect populations and potential habitat for special status plants within nine miles of the Bruneau and Jarbidge Canyon rims. Special status plants in these areas include Cusick's primrose, Davis peppergrass, and spine-node milkvetch. However, relocation of troughs and establishment of new troughs, reservoirs, permanent fences, and corrals in locations at least one mile from the canyon rims would shift potential disturbance from these developments to populations and habitats located further from the canyon rim. Special status plants affected by these actions would include Davis peppergrass, spine-node milkvetch, slickspot peppergrass, and special status plants in the Desert Annual Group.

Impacts from Management Specific to Alternative II

Actions for special status species management in Alternative II would generally maintain or improve the status of special status plants and their habitats. The effects of livestock management actions would be the same as those described for Alternative I.

Alternative II differs from Alternative I through lack of specific direction to identify and monitor pollinators. The lack of identification and monitoring of pollinators would result in implementation of activities that would indirectly affect special status plants, including chemical control of insect pests. Alternative II also only allows the re-introduction of plants listed under the Endangered Species Act (ESA) as Threatened or Endangered or plants that are Proposed or Candidates for listing under ESA. Re-introduction of Listed, Proposed, or Candidate plants would increase the number of populations or individuals in existing populations and would eventually lead to the lack of need for listing under the ESA. However, the lack of assisted re-introduction for other BLM Sensitive plants would not allow for more rapid expansion of populations than under natural conditions and would tend to contribute to the need for continued special management.

Allowing native grasslands to transition to native shrublands would expand potential habitat for special status plants associated with shrub communities. The addition of forbs to existing native shrubland communities would indirectly affect special status plants by increasing food and habitat for pollinators, thus potentially increasing and diversifying pollinator populations. The lack of active restoration of annual, non-native perennial, and non-native understory communities would reduce short-term impacts to plants or seed banks due to treatments, but would limit long-term habitat improvement and expansion. The lack of livestock restrictions in bighorn sheep habitat would indirectly result in livestock-associated impacts to Cusick's primrose, Davis peppergrass, and spine-node milkvetch.

Impacts from Management Specific to Alternative III

Actions for special status species management in Alternative III would generally maintain or improve the status of special status plants and their habitats. The effects of livestock management actions would be the same as those described for Alternative I.

Alternative III is identical to Alternative II regarding lack of specific direction to identify and monitor pollinators and by only allowing re-introduction of plants listed under ESA as Threatened or Endangered, or plants that are Proposed or Candidates for listing under ESA. The effects would be the same as those described for Alternative II.

The introduction of shrubs to native grassland communities would expand potential habitat for special status plants associated with shrub communities. Protection of sagebrush communities through the establishment of extensive fuel breaks would protect existing populations and habitat, but would fragment potential habitat for special status plants. The lack of active restoration of annual, non-native perennial, and non-native understory communities would reduce short-term impacts to plants or seed banks due to treatments, but would limit long-term habitat improvement and expansion. The lack of livestock restrictions for bighorn sheep habitat would indirectly result in livestock-associated impacts to Cusick's primrose, Davis peppergrass, and spine-node milkvetch.

Impacts from Management Specific to Alternative IV

Actions for special status species management in Alternative IV would generally maintain or improve the status of special status plants and their habitats. The effects of livestock management actions would be the same as those described for Alternative I.

Actions under Alternative IV would expand potential habitat through active restoration of annual, non-native perennial, and non-native understory communities to native shrubland. Restoration projects would result in disturbance, including chemical, seeding, or prescribed fire treatments, to special status plants or their seed banks occurring in these communities. Re-establishment of special status plants in historically occupied, but currently unoccupied habitat would expand and connect populations and would eventually result in a reduced need for special management. Identification and monitoring of special status plant pollinators would provide information to guide activities that would indirectly affect special status plants, including chemical control of insect pests (e.g., grasshoppers, Mormon crickets). The addition of forbs to existing native shrubland communities would indirectly affect special status plants by increasing food and habitat availability for pollinators, thus potentially increasing and diversifying pollinator populations.

Actions that protect populations and habitat for bighorn sheep, including restrictions on water developments, fences, sheep trailing, and conversion from cattle to sheep would generally protect populations and potential habitat for special status plants within nine miles of the Bruneau and Jarbidge Canyon rims, including Cusick's primrose, Davis peppergrass, and spine-node milkvetch. However, relocation of troughs and establishment new troughs, reservoirs, permanent fences, and corrals in locations at least one mile from the canyon rims would shift potential disturbance from these developments to populations and habitats located further from the canyon rim. Special status plants affected by these actions would include Davis peppergrass, spine-node milkvetch, slickspot peppergrass, and special status plants in the Desert Annual Group.

Impacts from Management Specific to Alternative V

The effects of Alternative V would be similar to those described for Alternative IV. Under Alternative V, habitat restoration for sage-grouse and other special status species would be less extensive. Treatments that would result in potential short-term impacts would occur primarily in annual communities. Limiting treatments in non-native perennial communities to the re-establishment of sagebrush and the absence of treatments in non-native understory communities would eliminate disturbance of existing special status plants and seed banks in those communities. However, this would also reduce potential native habitat relative to Alternatives I and IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would generally maintain or improve the status of special status plants and their habitats. The effects of livestock management actions would be the same as those described for Alternative I.

Actions under Alternative VI would expand potential habitat through active restoration of annual, non-native perennial, and non-native understory communities to native shrubland. Restoration projects would result in disturbance, including chemical, seeding, or prescribed fire treatments, to special status plants or their seed banks occurring in these communities. Re-establishment of special status plants in historically occupied, but currently unoccupied habitat would expand and connect populations and would eventually result in a reduced need for special management. Identification and monitoring of special status plant pollinators would provide information to guide activities that would indirectly affect special status plants, including chemical control of insect pests (e.g., grasshoppers, Mormon crickets). The addition of forbs to existing native shrubland communities would indirectly affect special status plants by increasing food and habitat availability for pollinators, thus potentially increasing and diversifying pollinator populations.

Actions that protect populations and habitat for bighorn sheep, including restrictions on water developments, fences, sheep trailing, and not allowing conversion from cattle to sheep would generally protect populations and potential habitat for special status plants within nine miles of the Bruneau and Jarbidge Canyon rims, including Cusick's primrose, Davis peppergrass, and spine-node milkvetch. Special status plants affected by these actions would include Davis peppergrass, spine-node milkvetch, slickspot peppergrass, and special status plants in the Desert Annual Group.

Impacts from Upland Vegetation Actions

The following indicators were used to analyze the impacts of Upland Vegetation actions on special status plants:

- Potential for impact to plants or populations,
- Potential for impact to occupied or potential habitat, and
- Potential for impact to seed banks.

Most special status plants would be affected by actions that maintain a vegetation sub-group (VSG) or would result in conversion of one VSG to another. Treatments would directly affect individual plants, plant populations, or their seed banks. Treatments would also directly or indirectly affect the quantity and quality of occupied and/or potential habitat.

The impacts of upland vegetation actions were assessed by Vegetation Management Area based on anticipated change in the relative proportions of VSGs in the entire planning area between 2016

(projected vegetation coverage) and following implementation of all vegetation treatments. Short-term effects would be primarily for treatment implementation, which would include biological, chemical, mechanical, planting, prescribed fire, seeding, and targeted grazing treatments. These would result in removal of above-ground biomass or heating, burning, or physical disruption of root systems or seed banks. Treatments that occur during the active growing period in the spring would have greater potential for damaging or killing plants. Treatments occurring when special status plants are dormant would be less likely to damage or kill plants. These treatments would tend to affect perennial plants to a greater extent than annuals due to potential for disturbance to established plants and their root systems.

Long-term effects would be based on the expected outcome of vegetation treatments.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, there would be an increase in the relative proportion of non-native perennial communities through conversion of annual communities, and removal of shrubs in non-native understory communities. There would be little change in overall composition of VSGs or successional stages within the planning area.

The No Action Alternative would likely maintain or decrease special status plant numbers or potential habitat as a result of vegetation treatments. Short-term effects would be primarily from treatment implementation, which would include chemical, mechanical, seeding, planting, and prescribed fire treatments. These would result in removal of above-ground biomass or heating, burning, or physical disruption of root systems or seed banks. Treatments applied during spring, including chemical treatments to suppress invasive annual plants, would have the greatest potential to damage or kill special status plants. In particular, chemical treatment would result in mortality of special status plants in the Desert Annual Group and other low-elevation species, as treatment timing would likely coincide with the active growth period for these plants. Treatments occurring when special status plants are dormant, such as seeding, would be less likely to damage or kill annual plants. These treatments would tend to affect perennial plants to a greater extent than annuals due to the potential for disturbance to established plants and their root systems. Mechanical removal of shrub overstory is unlikely to directly affect special status plants, but would decrease potential habitat for special status plants that are ecologically tied to shrubland communities.

In the long term, treatments to convert annual communities to non-native perennial would reduce competition from invasive annual plants and provide a more stable environment. However, the resulting plant communities would be relatively homogenous in both species and structural diversity, which would limit potential habitat for special status plants that are ecologically tied to shrubland communities.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction to reduce or eliminate improper uses or over-allocation of vegetation, particularly during vulnerable periods such as growing seasons, drought periods, or seeding establishment. These actions would indirectly protect special status plants or their habitats by reducing potential impacts of uses and maintaining acreages resulting from upland vegetation treatments.

Impacts from Management Specific to Alternative I

Upland vegetation actions in Alternative I would increase the relative proportion of native shrubland through conversion of annual, non-native perennial, non-native understory, and native grassland communities. Alternative I would decrease the relative proportion of communities dominated by uncharacteristic and early-successional native vegetation and increase the relative proportion of communities dominated by mid-successional native vegetation.

Alternative I would likely maintain or increase special status plant numbers or potential habitat as a result of vegetation treatments. Under Alternative I, short-term effects of treatments would be similar to those described for the No Action Alternative but would also include biological and targeted grazing treatments and exclude prescribed fire. Biological treatments, including use of predatory insects or fungal or bacterial pathogens, would not likely result in impacts to special status plants. Such methods are usually targeted

for specific species or groups and would need to be selected to eliminate potential impacts to special status plants, their pollinators, or habitats.

Targeted grazing would occur primarily in early spring to reduce fine fuels as well as populations of noxious weeds and invasive plants. This would result in short- or long-term control, depending on biology of the target plants. Special status plants in treatment areas would be impacted by removal of above-ground biomass or damage to plants by trampling. The effectiveness of targeted grazing for invasive annuals would be temporary and localized (Launchbaugh et al., 2008; Vallentine and Stevens, 1994) and would need to be repeated yearly or coupled with other treatments (e.g., chemical, seeding with perennial plants) for long-term effect (Hempy-Mayer and Pyke, 2008). Targeted grazing would tend to adversely affect special status plants in the Desert Annual Group and other low-elevation species, as treatment timing would likely coincide with the active growth period for these plants.

Although these impacts would occur, any proposal to use targeted grazing would take these potential impacts into account. The degree to which these impacts are likely would vary depending on the specific proposal. The decision whether to use targeted grazing would take the potential impacts, beneficial or adverse, at that specific location into consideration.

In the long term, treatments that convert annual communities to non-native perennial and native grassland communities would reduce competition from invasive annual plants and provide a more stable environment. Conversion of annual, non-native perennial, non-native understory, and native grassland communities to native shrubland would enhance and expand potential habitat for special status plants that are ecologically tied to shrubland communities.

Actions that would diversify species composition in non-native understory, native grassland, and native shrubland communities, particularly with forbs, would indirectly affect special status plants through increase of food and habitat availability for pollinators, thus potentially increasing and diversifying pollinator populations which would lead to higher seed production and replenishing of seed banks.

Reference areas in Alternative I would exclude grazing from known populations of slickspot peppergrass and Greeley's wavewing. The effects of ungrazed areas are discussed under *Impacts from Livestock Grazing Actions*.

Management to maintain or improve the cover and composition of biological soil crusts in native grasslands and shrublands would improve potential habitat for special status plants and would reduce competition from noxious weeds or invasive plants. Research has indicated that biological soil crusts form a physical or chemical barrier to some invasive plants and reduce potential for establishment (Gelbard and Belnap, 2003; Kaltenecker et al., 1999). Biological soil crusts might also contribute to persistence of special status plants by providing favorable conditions for enhanced soil moisture and nutrients.

Impacts from Management Specific to Alternative II

Upland vegetation actions in Alternative II would be similar to the No Action Alternative. Compared to the projected upland vegetation for 2016, the relative proportion of the Non-Native Perennial VSG would increase through the conversion of annual and non-native understory communities. The relative proportions of the Native Grassland and Native Shrubland VSGs would be maintained while enhancing diversity through seeding of late-successional grasses. Actions in Alternative II are unlikely to change the current relative proportions of native plant community successional stages or uncharacteristic vegetation.

The effects of treatments to convert annual and non-native understory communities to non-native perennial would be similar to those described for the No Action Alternative and Alternative I. Long-term effects would be the same as those described for the No Action Alternative. Alternative II includes the potential use of prescribed fire treatments in annual and non-native understory communities. Short-term effects to special status plants would include removal of above-ground biomass by prescribed fire and heating of soil that would burn or damage root systems and seed banks.

The impacts from interseeded late-successional grasses into native grassland and shrubland are anticipated to be short-term. Interseeding would have the long-term effect of diversifying herbaceous

plant structure, which would enhance habitat for special status plants. Allowing conversion of native grassland to native shrubland through natural recruitment or inclusion of shrubs in emergency stabilization and burned area rehabilitation treatments for burned native grassland and shrubland would maintain and potentially expand habitat for special status plants ecologically tied to shrubland communities. This effect would be slow, particularly in low elevation/low precipitation locations, and might not occur over the life of the plan (see the *Upland Vegetation* section).

Reference areas in Alternative II would exclude grazing from known populations of slickspot peppergrass. The effects of ungrazed areas are discussed under *Impacts from Livestock Grazing Actions*.

Impacts from Management Specific to Alternative III

Upland vegetation actions in Alternative III would reduce the amount and continuity of fine fuels throughout the planning area. This would be accomplished by increasing the relative proportion of non-native perennial communities through conversion of annual communities, and increasing the relative proportion of native shrubland communities through the addition of shrubs to native grassland communities. Treatments in native communities would decrease the relative proportion of early-successional, native communities and increase the relative proportion of mid-successional communities.

The short-term effects of treatments used to convert annual communities to non-native perennial or native grassland would be similar to those described for the No Action Alternative, Alternative I (biological control and targeted grazing), and Alternative II (prescribed fire). The long-term effects would be similar to those described for the No Action Alternative.

Impacts to special status plants from treatments used to incorporate shrubs into existing native grassland are anticipated to be minimal. Shrubs would likely be seeded through aerial or ground application or hand planting. Ground application through broadcast or aerial seeding would not disturb special status plants or their seed banks. Interseeding would result in some soil surface disturbance and would disrupt existing plants or seed banks. This effect is expected to be short-term. The long-term effects of treatment would include enhancement and expansion of potential habitat for special status plants that are ecologically tied to shrubland communities. These effects would be discontinuous over the landscape due to vegetation patchiness. Should wildland fire occur, discontinuity of vegetation types would result in a mosaic of burn intensities and unburned patches that would function as refugia for native seed dispersal, including special status plants (Longland and Bateman, 2002; Whisenant, 1990).

Reference areas in Alternative III would exclude grazing from known populations of slickspot peppergrass. The effects of ungrazed areas are discussed under *Impacts from Livestock Grazing Actions*.

Impacts from Management Specific to Alternative IV

Actions in Alternative IV would create a landscape dominated by native vegetation with an emphasis on mid-successional shrubland communities and to increase the amount and continuity of communities dominated by shrubs. Actions would increase both the relative proportion and continuity of the Native Shrubland VSG through conversion of annual, non-native perennial, and non-native understory communities and diversification of native grassland communities. The addition of shrubs to existing non-native perennial communities would increase the relative proportion of the Non-Native Understory VSG. Increases in the relative proportion of mid-successional native shrubland communities would increase species diversity and structural complexity throughout the planning area.

The short- and long-term treatment effects for special status plants, their seed banks, and potential habitat would be similar to those described for Alternative I. The short-term effects of treatment would be greater in Alternative IV compared to Alternative I due to a larger number of acres treated. The long-term effects would also cover a larger geographic area and would result in larger acreages of continuous native shrubland habitat compared to Alternative I. The effects of treatments to introduce shrubs into native grassland would be similar to those described for Alternative III. The short-term effects would include those of prescribed fire, as described for Alternative II, but would potentially be used in all plant community types.

Reference areas in Alternative IV would exclude grazing from known populations of slickspot peppergrass and Greeley's wavewing. The effects of ungrazed areas are discussed under *Impacts from Livestock Grazing Actions*.

The effects of management to maintain or improve cover and composition of biological soil crusts would be similar to those described for Alternative I, but would extend to the entire planning area.

Impacts from Management Specific to Alternative V

Actions for upland vegetation in Alternative V would increase the amount and continuity of communities dominated by shrubs within the planning area through conversion of annual, non-native perennial, and native grassland communities. Increasing the relative proportion of the Non-Native Understory VSG would provide for added structural complexity in existing non-native perennial communities. Increasing the relative proportion of mid-successional native shrubland communities would increase species diversity and structural complexity throughout the planning area. Alternative V would not convert as much acreage of annual communities to perennial as Alternative IV and would rely on seeding techniques that would minimize soil surface disturbance. Treatments implemented under Alternative V would result in shrubland acreages similar to Alternative IV. However a larger proportion of the shrubland acreage would be non-native understory communities due to a more passive approach to adding structural diversity to existing plant communities. Chemical treatments would be minimal; targeted grazing would not be used under Alternative V.

Alternative V would result in the fewest short-term treatment effects to special status plants, their seed banks, and potential habitats due to actions to minimize soil disturbance and effects from chemical and grazing treatments. The long-term effects would be similar to those described for Alternative IV, but shrubland communities would include a larger proportion of non-native understory

Reference areas in Alternative V would exclude grazing from known populations of Greeley's wavewing, calcareous buckwheat, matted cowpie buckwheat, Janish penstemon, and slickspot peppergrass. The effects of ungrazed areas are discussed under *Impacts from Livestock Grazing Actions*.

The effects of management to maintain or improve cover and composition of biological soil crusts would be the same as for Alternative IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Actions in Alternative VI would create a landscape dominated by native vegetation with an emphasis on mid-successional shrubland communities and to increase the amount and continuity of communities dominated by shrubs. Actions would increase both the relative proportion and continuity of the Native Shrubland VSG through conversion of annual, non-native perennial, and non-native understory communities and diversification of native grassland communities. The addition of shrubs to existing non-native perennial communities would increase the relative proportion of the Non-Native Understory VSG. Increases in the relative proportion of mid-successional native shrubland communities would increase species diversity and structural complexity throughout the planning area.

The short- and long-term treatment effects for special status plants, their seed banks, and potential habitat would be similar to those described for Alternative I. The short-term effects of treatment would be greater in Alternative VI compared to the No Action Alternative and Alternatives I, II, and III due to a larger number of acres treated. The long-term effects would also cover a larger geographic area and would result in larger acreages of continuous native shrubland habitat compared to Alternative I. The effects of treatments to introduce shrubs into native grassland would be similar to those described for Alternative III. The short-term effects would include those of prescribed fire, as described for Alternative II, but would potentially be used in all plant community types.

Reference areas in Alternative VI would exclude grazing from known populations of slickspot peppergrass. The effects of ungrazed areas are discussed under *Impacts from Livestock Grazing Actions*.

The effects of management to maintain or improve cover and composition of biological soil crusts would be similar to those described for Alternative I, but would extend to the entire planning area.

Impacts from Noxious Weeds and Invasive Plants Actions

The following indicators were used to analyze the impacts of Noxious Weeds and Invasive Plants actions on special status plants:

- Potential for impact to plants or populations and
- Potential for impact to occupied or potential habitat.

The introduction and spread of noxious weeds and invasive plants into native vegetation communities can result in direct impacts to special status plants through direct or indirect competition (Rosentreter, 1994) or indirect impacts resulting from changes in plant community structure or soil characteristics, including soil chemistry, structure, nutrients, or hydrology. Actions affecting noxious weeds and invasive plants would result in changes to existing occupied or potential habitat for special status plants. As noxious weed and invasive plant populations increase in size and frequency, they tend to reduce the diversity of surrounding native plant communities, altering the composition and community structure. As noxious weed and invasive plant populations are reduced, native vegetation is expected to increase in terms of acreage, cover, and diversity.

Management actions that would result in the conversion of the Annual vegetation sub-group (VSG) to other VSGs are addressed under *Impacts from Upland Vegetation Actions.* Since inventoried acres for noxious weeds and areas where invasive plants are not dominant are not available for the planning area, the effects of actions for noxious weeds and invasive plants are addressed in the context of potential for introduction and spread, or potential to control, contain, or eradicate populations.

Impacts from Management Specific to the No Action Alternative

Management actions specific to the No Action Alternative provide no objectives or clear prioritizations for the inventory or control of noxious weeds and would likely result in increased occupied acreages and diversity of noxious weeds and invasive plants within the planning area. The No Action Alternative would incorporate current guidelines from biological opinions, Candidate Conservation Agreements, management plans for Areas of Critical Environmental Concern and other special designations, and other pertinent policies. This would impose treatment restrictions that would reduce potential for chemical or biological treatment impacting special status plants covered by these documents. However, this action would not extend to all special status plants and would not insure against inadvertent treatment.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide for proactive management to limit the introduction and spread of noxious weeds and invasive plants. An inventory would have the overall impact of quantifying existing conditions and providing a baseline for evaluation of risk for new invasions and spread of existing populations. Up-to-date inventories would also provide a basis for treatment prioritization. Appropriate prioritization and methods of control for treatments in or near special status species habitat would reduce the risk of introduction and spread and increase the potential for the control or eradication of noxious weeds and invasive plants, while reducing impacts to non-target plants, including special status plants.

Impacts from Management Specific to Alternative I

Management actions under Alternative I would control or eradicate noxious weeds and invasive plants in known special status plant habitats and potential habitats in special designations and native plant communities.

Impacts from Management Specific to Alternative II

Management actions under Alternative II would control or eradicate noxious weeds and invasive plants in known special status plant habitats and potential habitats in riparian areas and native plant communities.

Impacts from Management Specific to Alternative III

Management actions under Alternative III would control or eradicate noxious weeds and invasive plants in known special status plant habitats and potential habitats in special designations. However, since Alternative III would place the most focus on treatments to reduce fuel loads, it would do the least of all alternatives to reduce potential for introduction and spread, control, or eradication of noxious weeds in potential special status plant habitats.

Impacts from Management Specific to Alternative IV

Management actions under Alternative IV would control or eradicate noxious weeds and invasive plants in known special status plant habitats and potential habitats in special designations, riparian habitats, and native plant communities. Alternative IV would treat the most acreage and would have the greatest potential of all alternatives to reduce introduction and spread, and control or eradicate noxious weeds and invasive plants in occupied and potential special status plant habitats.

Impacts from Management Specific to Alternative V

Management actions under Alternative V would control or eradicate noxious weeds and invasive plants in known special status plant habitats and potential habitats in special designations, riparian habitats, and native plant communities. Alternative V would treat the second largest acreage of the alternatives and would have intermediate potential to reduce introduction and spread, and control or eradicate noxious weeds and invasive plants in occupied and potential special status plant habitats. Methods prescribed under Alternative V are more passive than for other alternatives; therefore, treatment utilizing non-chemical means for control or eradication might require repeated application. Conversely, methods used to control or eradicate noxious weeds and invasive plants under Alternative V would tend to reduce the potential for treatment and impacts to non-target vegetation, including special status plants. The spread of noxious weeds and invasive plants in occupied or potential special status plant habitats would be reduced by lack of soil surface disturbance and seed transport associated with livestock grazing.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Management actions under Alternative VI would control or eradicate noxious weeds and invasive plants in known special status plant habitats and potential habitats in special designations, riparian habitats, native plant communities, and motorized access points. Alternative VI would control or eradicate noxious weeds and invasive plants in occupied and potential special status plant habitats.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on special status plants:

- Potential for impact to plants or populations,
- Potential for impact to occupied or potential habitat, and
- Potential for impact to seed banks.

The effects of wildland fire management actions are primarily to the plant community as a whole and are discussed in the *Upland Vegetation* section. Critical suppression areas can result in protection of special status plants. Table 4-133 identifies the special status plants within critical suppression areas for each alternative.

Table 4-133. Known Special Status Plant Populations in Critical Suppression Areas by Alternative

Species	Alternative [A]						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Annual/Biennial Forbs							
Alkali cleomella [B]	X	X	X	X	X	X	X
Desert pincushion [B]							
Least phacelia						X	
Rigid threadbush [B]	X		X	X	X	X	X

Species	Alternative [A]						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Annual/Biennial Forbs							
Slickspot peppergrass	X		X	X	X	X	X
Spreading gilia [B]	X		X	X	X		X
White eatonella [B]							
White-margin waxplant [B]	X	X	X	X	X	X	X
Perennial Forbs							
American wood sage							
Broadleaf fleabane	X	X	X	X	X	X	X
Bruneau River phlox	X	X	X	X	X	X	X
Calcareous buckwheat	X	X	X	X	X	X	X
California damasonium							
Chatterbox orchid	X	X	X	X	X	X	X
Cusick's primrose	X			X	X	X	
Davis peppergrass	X		X	X	X	X	X
Four-wing milkvetch	X		X	X	X	X	X
Greeley's wavewing	X	X	X	X	X	X	X
Janish penstemon	X	X	X	X	X	X	X
Lewis buckwheat				X		X	
Matted cowpie buckwheat	X	X	X	X	X	X	X
Newberry's milkvetch	X		X	X	X	X	X
Owyhee milkvetch							
Packard's cowpie buckwheat	X	X	X	X	X	X	X
Simpson's hedgehog cactus	X		X	X	X	X	X
Snake River milkvetch	X		X	X	X	X	X
Spine-node milkvetch	X	X	X	X	X	X	X
Two-headed onion	X		X	X	X	X	X
Non-Vascular Plants							
Earth lichen	X		X	X	X	X	X
Woven-spore lichen							

[A] The No Action Alternative identifies the entire planning area as Full Suppression. Impacts are most similar to those in conditional suppression areas because of the lack of prioritization within the planning area.
[B] Desert Annual Group.
Source: Idaho Department of Fish and Game, Idaho Natural Heritage Program; and BLM field inventory.

Fire suppression priorities and activities would result in direct impacts to special status plants, including removal or disturbance of plants, their seed banks, or habitat due to wildland fire suppression activities or burning. Post-fire emergency stabilization and burned area rehabilitation (ES&BAR) activities or fuels reduction actions would result in physical disturbance of existing plants or seed banks, or modification of existing or potential habitat.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the entire planning area is under full suppression; therefore, there is no prioritization for wildland fire suppression. Lack of prioritization reduces the potential for critical resource needs to be identified and acted on in the event of multiple starts. Therefore, there is a higher potential for any location in the planning area to burn under the No Action Alternative compared to the action alternatives. This would also increase potential for burning of occupied or potential special status plant habitats.

Actions that would limit surface disturbance would reduce potential for disturbance or destruction of special status plants, seed banks, or occupied or potential habitat due to construction of new control lines.

Impacts from Management Common to All Action Alternatives

Most management common to all action alternatives would not directly affect special status plants, their seed banks, or occupied or potential habitat. The direction to use best management practices would reduce the potential for disturbance or destruction of known populations and occupied habitat from wildland fire suppression activities; however, these protections would not occur if life or property are threatened and would not extend to potential habitats. Direction to consider resource values and management prescriptions for Areas of Critical Environmental Concern (ACECs) would reduce the potential for disturbance or destruction of special status plants or their habitats where they are a relevant and important value. The use of guidelines referenced in the Aquatic and Riparian Management Strategy (Appendix D) would reduce the potential for disturbance or destruction of special status plants occurring in riparian habitats due to suppression activities or fuels treatments.

Utilizing seeding equipment, tools, or techniques that minimize soil disturbance would reduce the potential for disturbance or destruction of special status plants, or disturbance of seed banks or habitat. Resting areas with fuels or ES&BAR treatments from uses until objectives are met would increase the potential for success. This would also increase the potential for recovery of special status plants or habitats in treated areas.

Impacts from Management Specific to Alternative I

Wildland fire management actions in Alternative I would maintain or slightly decrease occupied or potential habitat for special status plants. Alternative I identifies 491,000 acres (36% of the planning area) as critical suppression areas with priorities in the wildland urban interface (WUI); the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, and Salmon Falls Creek ACECs; and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative I, priority vegetation sub-groups (VSGs) would be Native Grassland and Native Shrubland.

Known populations of 22 special status plants would be protected within critical suppression areas. Multiple populations for some species occur within the critical suppression areas. Not all populations occur in native plant communities; they might occur in annual, non-native perennial, non-native understory, or unvegetated areas within priority areas. Critical suppression priorities would protect 59% of native plant communities in the planning area prior to implementation of vegetation treatments and 52% of the planning area upon completion of treatments.

Allowing wildland fire to burn annual and non-native perennial communities within the perimeter of an active wildland fire would facilitate restoration of these communities to native shrubland. This would result in expansion of potential habitat for special status plants that are ecologically tied to native shrubland communities.

Approximately 11,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative I. Fuel breaks placed to protect restoration and ES&BAR treatments would enhance the potential for treatment success and expansion of potential habitat for special status plants. However, fuel breaks also create linear disturbances that can facilitate introduction and spread of noxious weeds and invasive plants (Merriam et al., 2006) into occupied and potential habitat. Actions to locate fuel breaks in existing disturbance corridors and to treat noxious weeds and invasive plants in fuels reduction projects would reduce this potential.

Soil surface disturbance associated with wildland fire suppression activities would disturb or destroy some special status plants or disturb seed banks or potential habitat. Occupied and potential habitat would be indirectly affected by the increased potential for the introduction and spread of noxious weeds and invasive plants resulting from wildland fire suppression activities or burning. Application of minimum impact suppression tactics in slickspot peppergrass habitat would decrease the potential for inadvertent disturbance or destruction of plants or disturbance of seed banks or habitat due to wildland fire suppression activities. Restriction of dozer blading within 300 feet of playas for protection of cultural resources would also protect populations of Davis peppergrass.

Impacts from Management Specific to Alternative II

Wildland fire management actions in Alternative II would reduce the acres of occupied or potential habitat for special status plants. Alternative II identifies 170,000 acres (12% of the planning area) as critical suppression areas with priorities in the WUI. Unburned patches of native and non-native perennial communities within the perimeter of an active wildland fire would be protected, while unburned annual communities would be allowed to burn. Based on suppression priorities in Alternative II, priority VSGs would be Native Grassland and Non-Native Perennial.

Known populations of 11 special status plants would be protected within critical suppression areas. Multiple populations for some species occur within the critical suppression areas. Not all populations occur in native plant communities; they might occur in annual, non-native perennial, non-native understory, or unvegetated areas within priority areas. Critical suppression priorities would protect 23% of priority VSGs in the planning area prior to implementation of vegetation treatments and 20% of the planning area upon completion of treatments.

Fire management priorities under Alternative II provide low levels of protection to resources outside of the WUI. Native and non-native perennial grasslands would be relatively resilient if burned. Critical suppression priorities do not extend to either native shrubland or non-native understory communities under Alternative II; therefore, these areas would be more likely to burn, resulting in loss of shrubland habitats and occupied and potential habitat for special status plants with ecological ties to native shrublands.

Approximately 13,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative II. Fuel breaks would be placed to protect commercial facilities. Fuel breaks would also be placed in non-native perennial communities to protect native communities; this would protect some occupied and potential habitat for special status plants. Fuel breaks however, also would facilitate introduction and spread of noxious weeds and invasive plants into those habitats. Integration of noxious weed and invasive plant treatments into fuels reduction projects would reduce this potential. The effects of fuels treatment methods are described under *Impacts from Upland Vegetation Actions.*

Soil surface disturbance associated with wildland fire suppression activities would disturb or destroy some special status plants or disturb seed banks or potential habitat. Occupied and potential habitat would be indirectly affected by increased potential for introduction and spread of noxious weeds and invasive plants resulting from wildland fire suppression activities or burning. Restricting dozer blading within 150 feet of playas for protection of cultural resources would also protect populations of Davis peppergrass.

Impacts from Management Specific to Alternative III

Wildland fire management actions in Alternative III would maintain or slightly decrease occupied or potential habitat for special status plants. Alternative III identifies 476,000 acres (35% of the planning area) as critical suppression areas with priorities in the WUI, the Bruneau-Jarbidge and Salmon Falls Creek ACECs, and key sage-grouse habitat. Unburned patches of native and non-native perennial communities within the perimeter of an active wildland fire would be protected, while unburned annual communities would be allowed to burn. Based on suppression priorities in Alternative III, priority VSGs would be Native Shrubland, Native Grassland, and Non-Native Perennial.

Known populations of 21 special status plants would be protected within critical suppression areas. Multiple populations for some species occur within the critical suppression areas. Not all populations occur in native plant communities; they might occur in annual, non-native perennial, non-native understory, or unvegetated areas within priority areas. Critical suppression priorities would protect 40% of priority VSGs in the planning area prior to implementation of vegetation treatments and 39% of the planning area upon completion of treatments.

Fire management priorities for critical suppression would not fully protect the priority VSGs within the planning area. Native grassland and non-native perennial communities would be relatively resilient if burned. Alternative III would result in continued loss of shrubland habitats and occupied and potential habitat for special status plants with ecological ties to native shrublands.

Alternative III contains the largest network of fuel breaks, placed in strategic locations to disrupt continuity of fuels and to protect important resources such as sage-grouse and slickspot peppergrass habitat. Approximately 25,000 acres (2% of the planning area) of vegetated fuel breaks and 19,000 acres (1% of the planning area) of unvegetated fuel breaks would be installed under Alternative III. This action would reduce the potential for disturbance of special status plants or their habitat associated with large wildland fires. However, it would also create a network of linear disturbance areas that can facilitate introduction and spread of noxious weeds and invasive plants (Merriam et al., 2006) into occupied or potential habitat. Treatment of noxious weeds and invasive plants in fuels reduction projects would reduce this potential.

Soil surface disturbance associated with wildland fire suppression activities would disturb or destroy some special status plants or disturb seed banks or potential habitat. Occupied and potential habitat would be indirectly affected by increased potential for introduction and spread of noxious weeds and invasive plants resulting from wildland fire suppression activities or burning.

Impacts from Management Specific to Alternative IV

Wildland fire management actions in IV would maintain or increase acreage of occupied or potential habitat for special status plants. Alternative IV-A identifies 594,000 acres (43% of the planning area) and Alternative IV-B identifies 552,000 acres (40% of the planning area) as critical suppression areas, with priorities in the WUI; the Bruneau-Jarbidge, Inside Desert, Jarbidge Foothills, and Lower Bruneau Canyon ACECs; and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative IV, priority VSGs would be Native Grassland and Native Shrubland.

Known populations of 23 and 22 special status plants would be protected within critical suppression areas under Alternatives IV-A and IV-B, respectively. Multiple populations for some species occur within the critical suppression areas. Not all populations occur in native plant communities; they might occur in annual, non-native perennial, non-native understory, or unvegetated areas within priority areas. Critical suppression priorities under Alternative IV-A would protect 73% of priority VSGs in the planning area prior to implementation of vegetation treatments and 58% of the planning area upon completion of treatments; critical suppression priorities under Alternative IV-B would protect 68% and 54%, respectively. Populations, seed banks, and occupied habitat and potential habitat for slickspot peppergrass would be protected within the Inside Desert ACEC. Alternative IV-A would protect more of the area supporting populations, seed banks, and occupied and potential habitats compared to Alternative IV-B.

The effects of wildland fire suppression activities, fuel breaks, and ES&BAR would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative V

Wildland fire management actions in Alternative V would maintain or increase the acres of occupied or potential habitat for special status plants. Alternative V identifies 1,041,000 acres (76% of the planning area) as critical suppression areas with priorities in the WUI; the Lower Bruneau Canyon, Middle Snake, and Sagebrush Sea ACECs; and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative V, priority VSGs would be Native Grassland and Native Shrubland.

Known populations of 23 special status plants would be protected within critical suppression areas. Multiple populations for some species occur within the critical suppression areas. Not all populations occur in native plant communities; they might occur in annual, non-native perennial, non-native understory, or unvegetated areas within priority areas. Critical suppression priorities would protect 100% of priority VSGs in the planning area prior to implementation of vegetation treatments and upon completion of treatments. Critical suppression priorities would tend to reduce the risk of burning in native plant communities to the greatest extent of all the alternatives. This would reduce potential for burning special status plant occupied and potential habitat.

The effects of wildland fire suppression activities, fuel breaks, and ES&BAR would be similar to those described for Alternative I. Approximately 7,000 acres (less than 1% of the planning area) of vegetated fuel breaks would be installed under Alternative V. Fuel breaks placed along roads would increasing the width of disturbance and the associated potential for introduction and spread of noxious weeds and invasive plants into occupied or potential habitat (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003; Merriam et al., 2006). Treatment of noxious weeds and invasive plants in fuels reduction projects would reduce this potential.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Wildland fire management actions under Alternative VI would maintain or increase acreage of occupied or potential habitat for special status plants. Alternative VI identifies 597,000 acres (44% of the planning area) as critical suppression areas, with priorities in the WUI; the Lower Bruneau Canyon, Sandpoint, Upper Bruneau Canyon, and Salmon Falls Creek ACECs; Saylor Creek Herd Management Area; occupied habitat for slickspot peppergrass; critical habitat for bull trout; and the sage-grouse management area. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative VI, priority VSGs would be Native Grassland and Native Shrubland.

Known populations of 21 special status plants would be protected within critical suppression areas. All occupied habitat for slickspot peppergrass would be protected within critical suppression areas. Multiple populations for some species occur within the critical suppression areas. Not all populations occur in native plant communities; they might occur in annual, non-native perennial, non-native understory, or unvegetated areas within priority areas. Critical suppression priorities under Alternative VI would protect 73% of priority VSGs in the planning area prior to implementation of vegetation treatments and 58% of the planning area upon completion of treatments.

The effects of wildland fire suppression activities, fuel breaks, and ES&BAR would be similar to those described for Alternative I.

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on special status plants:

- Potential for impact to plants or populations and
- Potential for impact to occupied or potential habitat.

The effects of livestock grazing actions are primarily effects to the plant community as a whole and are discussed in the *Upland Vegetation* section. Livestock grazing can alter herbaceous cover and may influence species composition and structure of upland vegetation communities (Saab et al., 1995), but the type and intensity of effects depend on factors such as type of livestock, stocking rate, season of use, use levels, and location and density of livestock facilities (e.g., fences, water, salt). The effects to special status plants can be direct (e.g., consumption, trampling, or uprooting of plants) or indirect (e.g., soil compaction, modification of soil nutrients or plant community composition and/or structure). Sheep would be more likely to consume forbs than cattle; however, trampling disturbance to forbs can be greater due to cattle than sheep (Vallentine, 2001).

Special status plants with populations in areas unavailable to livestock grazing would not experience impacts from livestock grazing. Bruneau River phlox is unaffected by livestock grazing due to occurrence of plants on vertical or overhanging canyon walls. For other special status plants, increased diversification of native plant communities (Anderson and Inouye, 2001) and biological soil crusts (Ponzetti and McCune, 2001) that would occur with long-term exclusion from grazing would result in expansion of special status plant habitats. However, the extent and quality of recovery is dependent on numerous factors, as discussed in the *Upland Vegetation* section. Livestock grazing exclusion would not necessarily reduce competition to special status plants from existing populations of noxious weeds and invasive plants.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 1,412,000 acres (97%) of the planning area would be available for livestock grazing and 51,000 acres (3%) of the planning area would be unavailable. Under the No Action Alternative, populations of 13 special status plants would be located in areas unavailable for grazing.

Livestock allocations would remain as current; animal unit months would increase with available forage due to completion of vegetation treatments. The effects of allocations to vegetation communities are described in the *Upland Vegetation* section. Allocations would be expected to maintain or decrease numbers of special status plants or populations as well as acres of occupied or potential habitat throughout the planning area. Local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

Increases in the miles of pipelines and fences and numbers of reservoirs, wells, or springs would result in increased density of linear disturbance and disturbed areas radiating from watering points and mineral supplement locations. The installation and maintenance of pipelines results in linear disturbance from burial and, unless pipelines are installed along existing roads, formation and maintenance of primitive roads through repeated use. Higher density of disturbed areas would increase the potential for direct or indirect effects to special status plants through trampling or consumption or competition with noxious weeds and invasive plants. Actions that exclude livestock from reservoirs and springs and prohibit placement of salting, feeding, holding facilities, or stock driveways in riparian areas would reduce the potential for disturbance or destruction of special status plants associated with those habitats.

Impacts from Management Common to All Action Alternatives

Management actions for livestock grazing common to all action alternatives provide direction and design criteria for implementation-level planning to reduce resource impacts. These actions would help maintain or improve plant community species diversity, structural complexity, and ecological function in upland and riparian plant communities and therefore would likely maintain or increase occupied or potential habitat for special status plants.

Impacts from Management Specific to Alternative I

Under Alternative I, 1,389,000 acres (94%) of the planning area would be available for livestock grazing and 74,000 acres (6%) of the planning area would be unavailable. Populations of 20 special status plants would be located in areas unavailable for grazing. Monitoring of special status plant populations and their habitats inside and outside of reference areas would provide information on livestock grazing impacts relative to plant community dynamics.

Livestock allocations under Alternative I would be similar to those described for the No Action Alternative. However, since use would be allocated over about 3% less acreage in the planning area, impacts would be spread over a slightly smaller area. This effect would be minor on the scale of the planning area.

The effects of allocations, estimated utilization levels, temporary non-renewable (TNR) permits, and actions to manage sage-grouse and big game habitat are described in the *Upland Vegetation* section. These actions would be expected to maintain or decrease numbers of special status plants or populations and acres of occupied or potential habitat at a landscape scale. Management under Alternative I would tend to maintain static conditions with some localized and periodic heavy use that would leave vegetation communities vulnerable to noxious weed and invasive plant introduction and spread. Local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

The impacts of targeted grazing to special status plants are described under *Impacts from Upland Vegetation Actions.*

The number, type, and density of range infrastructure developments under Alternative I would be similar to the No Action Alternative; however, locations would be modified to meet resource objectives. The effects of range infrastructure developments would be similar to those described for the No Action Alternative. Direction to locate minerals, supplements, new troughs, new reservoirs, and new holding facilities more than 300 feet from playas would reduce the potential for concentrated use in areas supporting Davis peppergrass. Prohibitions against new pipelines in Wilderness; eligible, suitable, and designated Wild and Scenic Rivers (WSRs); and Areas of Critical Environmental Concern (ACECs) would reduce potential for noxious weed and invasive plant introduction and spread in special status plant habitats.

The removal of fences would result in short-term disturbance due to access for removal of posts, wire, and other components. The long-term effects of fence removal to special status plants or their habitats would be dependent on continued use of established primitive roads and/or trails by humans and/or livestock, but would include recovery of vegetation adjacent to the former fence line. Recovery of plant communities in general and special status plants or their habitats in the vicinity of fence removal would be facilitated by treatment of noxious weeds and invasive plants.

The impacts described above would be moderated by implementation of management for special status species common to all alternatives and for this alternative specifically.

Impacts from Management Specific to Alternative II

Under Alternative II, 1,408,000 acres (96%) of the planning area would be available for livestock grazing and 55,000 acres (4%) of the planning area would be unavailable. Populations of 17 special status plants would be located in areas unavailable for grazing. The impacts from reference areas would be similar to Alternative I; however, the opportunity for determining landscape-level grazing effects to special status plants and their habitats would be somewhat reduced under Alternative II due to reduced number and size of reference areas.

Increased livestock allocations and anticipated increases in number and density of livestock infrastructure developments to support allocations under Alternative II would result in a higher density of disturbed areas compared to the No Action Alternative.

The effects of livestock allocations, estimated utilization levels, Reserve Common Allotments, TNR permits, and actions to manage sage-grouse habitat are described in the *Upland Vegetation* section. These actions would be expected to decrease the number of special status plants or populations and acres of occupied or potential habitat throughout the planning area. Management under Alternative II would tend to maintain static to downward-trending conditions with some localized and periodic heavy use that would leave vegetation communities vulnerable to noxious weed and invasive plant introduction and spread. While Reserve Common Allotments would not likely be located in slickspot peppergrass habitat, establishment in other locations would result in impacts to other special status plants. Local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

The impacts of targeted grazing to special status plants are described under *Impacts from Upland Vegetation Actions.*

The impacts described above would be moderated by implementation of management for special status species common to all alternatives and for this alternative specifically.

Impacts from Management Specific to Alternative III

Under Alternative III, 1,407,000 acres (96%) of the planning area would be available for livestock grazing and 56,000 acres (4%) of the planning area would be unavailable. Populations of 17 special status plants would be located in areas unavailable for grazing. The impacts from reference areas would be similar to Alternative I; however, the opportunity for determining landscape-level grazing effects to special status plants and their habitats would be somewhat reduced under Alternative III due to the reduced size of reference areas.

The effects of livestock allocations and infrastructure development would occur at a higher density within areas available to grazing compared to the No Action Alternative and Alternative I, but at a lower density compared to Alternative II. The effects of construction, installation, maintenance, and use of developments would be similar to those described for the No Action Alternative. The effects of fence removal or relocation would be similar to those described for Alternative I.

The effects of livestock allocations, estimated utilization levels, Reserve Common Allotments, TNR permits, and actions to manage sage-grouse habitat are described in the *Upland Vegetation* section. These actions would be expected to decrease the number of special status plants or populations and acres of occupied or potential habitat throughout the planning area. Management under Alternative III would tend to maintain static conditions with some localized and periodic heavy use that would leave vegetation communities vulnerable to noxious weed and invasive plant introduction and spread. While Reserve Common Allotments would not likely be located in slickspot peppergrass habitat, establishment in other locations would result in impacts to other special status plants. Local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

The impacts of targeted grazing to special status plants are described under *Impacts from Upland Vegetation Actions.*

The impacts described above would be moderated by implementation of management for special status species common to all alternatives and for this alternative specifically.

Impacts from Management Specific to Alternative IV

Under Alternative IV-A, 1,324,000 acres (90%) of the planning area would be available for livestock grazing and 139,000 acres (10%) of the planning area would be unavailable; under Alternative IV-B, 1,355,000 acres (92%) of the planning area would be available for livestock grazing and 108,000 acres (8%) of the planning area would be unavailable. Under Alternative IV-A, populations of 19 special status plants would be located in areas unavailable for grazing; populations of 18 special status plants would be located in areas unavailable for grazing under Alternative IV-B. Livestock exclusion would include areas in the Inside Desert ACEC identified for restoration of non-native perennial communities to native shrubland to support slickspot peppergrass. With the exception of Alternative V, the long-term effects of livestock exclusion would occur over larger and more contiguous areas, particularly for slickspot peppergrass populations and habitat within the Inside Desert ACEC. The opportunity for determining landscape-level grazing effects to special status plants and their habitats would be the same as for Alternative I.

The effects of livestock allocations, estimated utilization levels, Reserve Common Allotments, TNR permits, and actions to manage sage-grouse and big game habitat are described in the *Upland Vegetation* section. Management under Alternative IV would tend to increase species and structural diversity of plant communities, as well as cover and species composition of biological soil crusts. These actions would be expected to maintain or increase numbers of special status plants or populations and acres of occupied or potential habitat throughout the planning area. The local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

The impacts of targeted grazing to special status plants are described under *Impacts from Upland Vegetation Actions.*

It is expected that the number and density of all types of range infrastructure developments under Alternative IV would decrease compared to the No Action Alternative due to decreased allocations. This would decrease potential for direct or indirect affects to special status plants via trampling or consumption or competition with noxious and invasive plants (see the *Upland Vegetation* section). Locations of existing facilities would be modified to meet resource objectives. The effects of construction, installation,

maintenance and use of developments would be similar to those described for the No Action Alternative. The effects of fence removal or relocation would be similar to those described for Alternative I.

Direction to locate supplements, new troughs, new reservoirs, and new holding facilities more than 300 feet from playas would reduce the potential for concentrated use in areas supporting Davis peppergrass. Prohibitions against new pipelines in wilderness; eligible, suitable, and designated WSRs; and ACECs would reduce potential for increased noxious weed and invasive plant introduction and spread in special status plant habitats.

The impacts described above would be moderated by implementation of management for special status species common to all alternatives and for this alternative specifically.

Impacts from Management Specific to Alternative V

Under Alternative V, 1,160,000 acres (79%) of the planning area would be available for livestock grazing and 303,000 acres (21%) of the planning area would be unavailable. Populations of 20 special status plants would be located in areas unavailable for grazing. This would include areas in the Lower Bruneau Canyon and Middle Snake ACECs identified for restoration of annual and non-native perennial communities to native shrubland and non-native understory. The long-term effects of livestock exclusion would occur over the largest and most contiguous areas of all the alternatives. The opportunity for determining landscape-level grazing effects to special status plants and their habitats would increase under Alternative V due to the creation of large, pasture-size reference areas.

The effects of livestock allocations, estimated utilization levels, and actions to manage sage-grouse and big game habitat are described in the *Upland Vegetation* section. There would be no TNR permits, Reserve Common Allotments, or targeted grazing under Alternative V. Management under Alternative V would increase species and structural diversity of plant communities, as well as cover and species composition of biological soil crusts. These actions would be expected to maintain or increase the number of special status plants or populations and acres of occupied or potential habitat throughout the planning area. Local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

It is expected that the number and density of all types of range infrastructure developments under Alternative V would decrease compared to the No Action Alternative to due to decreased livestock allocations, especially in the Sagebrush Sea ACEC. This would decrease the potential for direct or indirect effects to special status plants via trampling or consumption or competition with noxious and invasive plants. Locations of existing facilities would be modified to meet resource objectives. Effects of construction, installation, maintenance and use of developments would be similar to those described for the No Action Alternative. The effects of fence removal or relocation would be similar to those described for Alternative I.

Direction to locate supplements, new troughs, new reservoirs, and new holding facilities more than 300 feet from playas would reduce the potential for concentrated use in areas supporting Davis peppergrass. Prohibitions against new pipelines would reduce potential for increased noxious weed and invasive plant introduction and spread in special status plant habitats throughout the planning area.

The impacts described above would be moderated by implementation of management for special status species common to all alternatives and for this alternative specifically (see *Impacts from Special Status Species Actions*).

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 1,406,000 acres (96%) of the planning area would be available for livestock grazing and 57,000 acres (4%) of the planning area would be unavailable. Populations of 17 special status plants would be located in areas unavailable for grazing. Monitoring of special status plant populations and their habitats inside and outside of reference areas would provide information on livestock grazing impacts relative to plant community dynamics.

Livestock allocations under Alternative VI would be similar to those described for the No Action Alternative. However, since use would be allocated over less acreage in the planning area, impacts would be spread over a slightly smaller area. This effect would be minor on the scale of the planning area.

The effects of livestock allocations, estimated utilization levels, TNR permits, and actions to manage sage-grouse and big game habitat are described in the *Upland Vegetation* section. These actions would be expected to maintain or increase numbers of special status plants or populations and acres of occupied or potential habitat throughout the planning area. Management under Alternative VI would tend to maintain static conditions with some localized and periodic heavy use that would leave vegetation communities vulnerable to noxious weed and invasive plant introduction and spread. Local impacts of allocations on special status plants and occupied or potential habitats would be dependent on grazing systems, including rotations, seasons of use, and stocking rates. These impacts to special status plants and their habitats would be analyzed in detail for specific implementation-level grazing actions.

The impacts of targeted grazing to special status plants are described under *Impacts from Upland Vegetation Actions.*

The number, type, and density of range infrastructure developments under Alternative VI would be similar to the No Action Alternative; however, locations would be modified to meet resource objectives. The effects of range infrastructure developments would be similar to those described for the No Action Alternative. Direction to locate minerals, supplements, new troughs, new reservoirs, and new holding facilities more than 300 feet from playas would reduce the potential for concentrated use in areas supporting Davis peppergrass.

The impacts described above would be moderated by implementation of management for special status species common to all alternatives and for this alternative specifically.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions on special status plants:

- Potential for impact to plants or populations and
- Potential for impact to occupied or potential habitat.

Cross-country motorized vehicle use, maintenance of routes, and route density can influence human-related disturbance, including introduction and spread of noxious weeds and invasive plants (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003) and human-caused fire (Svejcar, 2003). Changes in travel designation (open to cross-country motorized vehicle use, limited to designated routes, and closed to motorized vehicle use) and seasonal restrictions can influence vegetation continuity and condition. The effects to special status plants can be direct (removal or crushing of plants; physical disruption of soils containing rooted plants), or indirect (e.g., soil compaction or erosion, modification of soil nutrients or plant community composition or structure).

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 25% of the planning area would be open to cross-country motorized vehicle use, 70% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The majority of the closed area is in the wilderness. It is expected that cross-country motorized vehicle use would increase and that additional unplanned routes would be created by repeated use. This would result in a long-term increase in route density within the planning area.

Impacts to special status plants would occur due to damage or destruction of plants or disturbance to occupied or potential habitat resulting in increased potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction and protective mechanisms that would reduce direct and indirect impacts to special status plants and their habitats due to route or travel designations.

Impacts from Management Specific to Alternative I

Under Alternative I, less than 1% of the planning area would be open to cross-country motorized vehicle use, 91% would be limited to designated routes, and 8% would be closed to motorized vehicle use. About 3,600 acres of the Deadman/Yahoo Special Recreation Management Area (SRMA), contained within the Deadman/Yahoo Travel Management Area (TMA), would be designated open to cross-country motorized vehicle use. This relatively small area currently has a high density of motorized use, which would be expected to continue under the open designation. This would likely result in direct and indirect impacts to calcareous buckwheat, Greeley's wavewing, Janish penstemon, and Snake River milkvetch. Plants would be damaged or destroyed by vehicles.

Route density is expected to decrease over about 48% of the planning area. This decrease would be focused in the Canyonlands, Jarbidge Foothills, and Snake River TMAs. Decreased route density is expected to reduce indirect effects to special status plants and their habitats, primarily due to the lower potential for noxious weed and invasive plant introduction and spread.

About 49% of the planning area would retain the current level of route density and would occur primarily in the Devil Creek TMA. Since the focus of this TMA would be to balance livestock grazing management needs with restoration activities, it is anticipated that route locations would continue to access existing livestock facilities and would be modified on establishment of new facilities. Increased route density is expected to increase indirect effects to special status plants and their habitats, primarily due to higher potential for noxious weed and invasive plant introduction and spread.

Actions that allow game retrieval within 300 feet of a designated route and access to camp sites within 25 feet of a designated route would result in an expansion of potential risks to special status plants and their habitats beyond the designated route corridor. It is expected that these actions would result in low density disturbances adjacent to designated routes, and would cause localized degradation of plant communities, especially if repeated use occurred. Cross-country motorized vehicle use would also damage or destroy special status plants occurring in the area. Exemptions to motorized vehicle restrictions that allow cross-country travel would have effects similar to those described for the No Action Alternative.

Areas closed to motorized vehicle use would be free of impacts associated with cross-country motorized vehicle use and roads and would serve as refugia for native plants, including special status plants (Gelbard and Harrison, 2003).

Seasonal closures or restrictions on primitive roads, trails, and areas open to cross-country motorized vehicle use would reduce the potential for human-caused fire, and thus the potential for loss or modification of special status plant occupied and potential habitats. Implementation of best management practices (BMPs) to control noxious weeds and invasive plants in roadside areas would reduce impacts to upland vegetation in areas that would be open and limited to designated routes.

Impacts from Management Specific to Alternative II

Under Alternative II, none of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The lack of the open designation would eliminate impacts to special status plants and their habitats associated with that designation described for Alternative I.

Route density would be expected to increase in about 85% of the planning area, primarily within the Bruneau Desert TMA to facilitate access for commercial uses. Impacts of increased route density within the Bruneau Desert TMA would be similar to impacts described for the No Action Alternative. Route density would be expected to remain the same in about 15% of the planning area, primarily within the Canyonlands TMA to facilitate livestock grazing with mitigation for impacts to resources. Impacts within

the Canyonlands TMA would be similar to those described for the Devil Creek TMA in Alternative I. Unlimited motorized access off designated routes for game retrieval and within 100 feet of a designated route for camp site access in areas not closed to motorized use would result in impacts similar to those described in Alternative I, but would apply to most of the planning area. Exemptions to motorized vehicle restrictions that allow cross-country travel would have effects similar to those described for the No Action Alternative.

The wilderness and Wilderness Study Area (WSA), which are physically restrictive to motorized transportation, would be closed to motorized vehicle use under Alternative II, providing negligible protection to special status plants and their habitats.

The effects of implementation of BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative III

Under Alternative III, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, to special status plants and their habitats, would be similar to those described for Alternative I.

Route density would be expected to increase in about 2% of the planning area, primarily within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. The impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I.

Route density would be expected to remain the same in about 98% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. These TMAs would be managed to improve access and facilitate wildland fire prevention and suppression. Therefore, management might not increase route density, but would improve surface condition. Improvement of road condition would result in wider disturbance areas adjacent to roads due to increased maintenance, including mowing of roadside areas, and increased cover of noxious weeds and invasive plants due to increased use (Gelbard and Belnap, 2003). This would increase potential indirect impacts to special status plants and direct impacts to occupied and potential habitats occurring adjacent to improved routes.

The lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 25 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions to motorized vehicle restrictions that allow cross-country travel would have effects similar to those described for the No Action Alternative.

The Salmon Falls Creek Area of Critical Environmental Concern (ACEC), wilderness, and WSA, which are physically restrictive to motorized transportation, would be closed to motorized vehicle use in Alternative III, providing protection to special status plants and their habitats.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative IV

Under Alternative IV, less than 1% of the planning area would be open to cross-country motorized vehicle use, 93% would be limited to designated routes, and 7% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I.

Route density would be expected to increase in about 2% of the planning area, primarily within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. The impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I.

Route density would be expected to decrease in about 98% of the planning area, primarily within the Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs. Decreased route density is

expected to reduce indirect effects to special status plants and their habitats, primarily due to lower potential for noxious weed and invasive plant introduction and spread.

The lack of motorized access off designated routes for game retrieval and limiting motorized access to campsites to within 25 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions to motorized vehicle restrictions that allow cross-country travel would have effects similar to those described for the No Action Alternative.

Lands with wilderness characteristics, wilderness, and WSA would be closed to motorized vehicle use in Alternative IV. Closed areas would be free of impacts associated with off-road vehicle use and roads, and would serve as refugia for native plants, including special status plants (Gelbard and Harrison, 2003).

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, less than 1% of the planning area would be open to cross-country motorized vehicle use, 88% would be limited to designated routes, and 12% would be closed to motorized vehicle use. The effects of designated open areas in the Yahoo SRMA, which coincides with the Yahoo TMA, would be similar to those described for Alternative I but would be spatially reduced.

Route density would be expected to increase in less than 1% of the planning area, primarily within the Yahoo TMA to facilitate motorized recreational opportunities. The impacts of increased route density within the Yahoo TMA would be similar to impacts described for Alternative I, but would apply to less than 1% of the spatial area of Alternative I. The impacts from motorized recreation would adversely affect populations of calcareous buckwheat, Greeley's wavewing, and Snake River milkvetch.

Route density would be expected to decrease in about 99% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. Decreased route density is expected to reduce indirect effects to special status plants and their habitats, primarily due to lower potential for noxious weed and invasive plant introduction and spread.

Since the density of routes within the planning area would be reduced, lack of motorized access off designated routes for game retrieval and limiting motorized access to campsites to within 25 feet of a designated route would reduce off-road disturbance to the greatest degree of all the alternatives. The application of motorized vehicle restrictions to lessees, BLM permit holders, and right-of-way holders would reduce the potential for cross-country motorized vehicle use to the greatest degree of all the alternatives and would eliminate most impacts to special status plants and their habitats as described in the No Action Alternative.

Wilderness, WSA and Lands with Wilderness Characteristics would be closed to motorized vehicle use in Alternative V. The effects on special status plants and their habitats would be similar to Alternative I, but would cover a geographic area one and a half times greater in size.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman and Yahoo SRMA would be similar to those described for Alternative I. The effects of seasonal closures for wildland fire prevention would be similar to those described for Alternative I.

Areas closed to motorized vehicle use in Alternative VI would be limited to the Salmon Falls Creek ACEC, WSA, and wilderness, which are physically restrictive to motorized transportation. Closed areas would be

free of impacts associated with off-road vehicle use and roads described for the No Action Alternative, and would serve as refugia for native plants, including special status plants (Gelbard and Harrison, 2003).

Route density would be expected to increase in about 3% of the planning area, including within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in about 10% of the planning area, primarily within the Jarbidge Foothills. Route density would remain unchanged within 87% of the planning area, primarily in the Canyonlands, Devil Creek, and Snake River TMAs. The effects of route reduction would be similar to those described for Alternative I but would occur over about five times fewer acres. Route reduction and maintenance would tend to facilitate success of vegetation treatments by reducing potential for post-treatment human disturbance, as well as weed invasion and spread.

Lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 100 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative. Exemptions to motorized vehicle restrictions that allow cross-country motorized vehicle use would have effects similar to those described for the No Action Alternative.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on special status plants:

- Potential for impact to plants or populations and
- Potential for impact to occupied or potential habitat.

Special status plants and their habitats are identified as relevant and important values in the Bruneau-Jarbidge River, Inside Desert, Jarbidge Foothills, Lower Bruneau Canyon, Middle Snake, Sagebrush Sea, and Salmon Falls Creek ACECs. Table 4-134 identifies special status plants with known populations in nominated ACEC by alternative. Special status plants can also be directly or indirectly affected by actions that manage for other important and relevant values.

Table 4-134. Special Status Plants with Known Populations in Areas of Critical Environmental Concern by Alternative

Species	Alternative						
	No Action	I	III	IV		V	VI
				IV-A	IV-B		
Annual/Biennial Forbs							
Alkali cleomella [A]							
Desert pincushion [A]							
Least phacelia						X[H]	X[D]
Rigid threadbush [A]		X[D]		X[D]	X[D]	X[D]	
Slickspot peppergrass				X[F]	X[F]	X[H]	
Spreading gilia [A]		X[D]		X[D]	X[D]	X[D]	X[D]
White eatonella [A]							
White-margin waxplant [A]		X[D]		X[D,G]	X[D,G]	X[D,H]	X[D]
Perennial Forbs							
American wood sage							
Broadleaf fleabane				X[G]		X[H]	
Bruneau River phlox	X[B]	X[B,D]	X[B]	X[B,D]	X[B,D]	X[H]	X[D]
Calcareous buckwheat		X[E]				X[E]	
California damasonium							
Chatterbox orchid		X[D]		X[D]	X[D]	X[D]	

Species	Alternative						
	No Action	I	III	IV		V	VI
				IV-A	IV-B		
Perennial Forbs							
Cusick's primrose	X[B]	X[B]		X[B]	X[B]	X[H]	
Davis peppergrass	X[B]	X[B]	X[B]	X[B]	X[B]	X[H]	X[I]
Four-wing milkvetch				X[G]	X[G]	X[H]	
Greeley's wavewing		X[E]				X[E]	
Janish penstemon		X[E]				X[E]	
Lewis buckwheat				X[G]		X[H]	
Matted cowpie buckwheat		X[E]				X[E]	
Newberry's milkvetch				X[G]	X[G]	X[H]	
Owyhee milkvetch							
Packard's cowpie buckwheat		X[D]		X[D]	X[D]	X[D]	X[D]
Simpson's hedgehog cactus	X[B]	X[B]	X[B]	X[B]	X[B]	X[H]	
Snake River milkvetch		X[E]				X[E]	
Spine-node milkvetch		X[D]		X[D]	X[D]	X[D]	X[D]
Two-headed onion				X[G]	X[G]	X[H]	
Non-Vascular Plants							
Earth lichen				X[F]		X[H]	
Woven-spore lichen							

[A] Desert Annual Group
[B] Bruneau-Jarbidge River ACEC, [C] Salmon Falls Creek ACEC, [D] Lower Bruneau Canyon ACEC, [E] Middle Snake ACEC, [F] Inside Desert ACEC, [G] Jarbidge Foothills ACEC, [H] Sagebrush Sea ACEC, [I] Upper Bruneau Canyon ACEC
Note: Alternative II is not displayed because it has no proposed ACECs.
Source: Idaho Department of Fish and Game, Idaho Natural Heritage Program, and BLM field inventory.

Impacts from Management Specific to the No Action Alternative

Actions prescribed under the No Action Alternative for the Bruneau-Jarbidge ACEC would provide for specific and general protection for special status plants and their habitats. Protection of special status plants would be given priority over livestock and recreation use. Actions that would prohibit mineral and utility development and limit motorized vehicle use would also reduce potential habitat degradation for special status plants associated with noxious weed and invasive plant introduction and spread as described in the *Noxious Weeds and Invasive Plants* section.

Impacts from Management Specific to Alternative I

Actions prescribed under Alternative I for the Bruneau-Jarbidge ACEC would provide general protection for special status plants and their habitats in the Bruneau and Jarbidge Canyons and along the rims. Actions would tend to maintain native plant communities at the current acreage and condition. Required use of weed-free forage and straw, designating camp areas outside the ACEC, limiting motorized use to designated routes, prohibitions on mineral development, limits on new rights-of-way, and integrated treatment of noxious weeds and invasive plants would all reduce potential for introduction and spread of noxious weeds and invasive plants in occupied and potential habitat. Prioritization of the ACEC for critical suppression would reduce the potential for wildland fire-related impacts to special status plants and their habitats as described under *Impacts from Wildland Fire Ecology and Management Actions.* Placement of livestock facilities (e.g., fencing, salt, water) to draw livestock away from bighorn sheep habitat would protect special status plants and their habitats within the ACEC from concentrated use. This would also shift patterns of livestock use outside the ACEC and impact other special status plant populations.

Actions prescribed under Alternative I for the Lower Bruneau Canyon ACEC would provide specific and general management for special status plants. Alternative I promotes restoration of annual and non-native plant communities to native shrubland within the ACEC. The short- and long-term effects of vegetation treatments are described under *Impacts from Upland Vegetation Actions.* This would improve existing and expand potential habitat for special status plants. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical suppression would reduce the potential for modification or

loss of existing and restored habitats. Livestock grazing and new infrastructure would be allowed if compatible with desired success of restoration treatments and life-history needs for special status plants including support of pollinators and seed production. This would provide potential for special status plants to expand into restored habitats. Closure of the area to mineral leasing and salable mineral development would reduce potential degradation of habitat by introduction of noxious weeds and invasive plants.

Actions prescribed under Alternative I for the Middle Snake ACEC would provide specific and general management for special status plants. Actions prescribed under Alternative I would promote habitat restoration and transplant or seeding of special status plants. This would expand existing special status plant populations and their habitats. Integrated treatment of noxious weeds and invasive plants with special conditions applied for special status plants would reduce competition and habitat degradation and the potential for treatment impacts to special status plants. Prioritization of the ACEC for critical suppression would reduce the potential for modification or loss of existing or restored habitats. The effects of livestock grazing exclusion on upland vegetation communities are described under *Impacts from Livestock Grazing Actions*. Closure of the ACEC to mineral leasing and new salable mineral development would reduce potential for degradation of habitat introduction of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative II

No ACECs would be designated under Alternative II; therefore, protections afforded to areas with relevant and important values for special status plants and their habitats would not occur.

Impacts from Management Specific to Alternative III

The effects of actions prescribed under Alternative III for the Bruneau-Jarbidge ACEC would be similar to those described for Alternative I, but would apply to about 67% of the area of Alternative I. Road improvement of some designated routes would decrease potential for physical disturbance to potential special status plant habitat due to road braiding. Increased potential for noxious weed or invasive plant introduction and spread due to road improvement would be offset by integrated weed management within the ACEC.

Impacts from Management Specific to Alternative IV

Actions prescribed under Alternative IV for the Bruneau-Jarbidge ACEC provide specific direction to restore and protect Davis peppergrass habitat and populations. Actions would tend to maintain special status plant populations and their habitats by limiting human and livestock disturbance. Required use of weed-free forage and straw, designating camp areas outside the ACEC, limiting motorized use to designated routes, and integrated treatment of noxious weeds and invasive plants would all reduce risk of habitat degradation due to introduction and spread of noxious weeds and invasive plants. Prioritization of the ACEC for critical suppression would reduce the potential for wildland fire-related impacts to status plants and their habitats as described under *Impacts from Wildland Fire Ecology and Management Actions*. Placement of livestock facilities (e.g., fencing, salt, water) to draw livestock away from bighorn sheep habitat would protect special status plants and their habitats within the ACEC from concentrated use. This would also shift patterns of livestock use outside the ACEC and impact other special status plant populations.

Actions prescribed under Alternative IV for the Inside Desert ACEC would provide specific management to protect slickspot peppergrass populations and restore habitat. Alternative IV-B would protect 56% of the area of Alternative IV-A. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical suppression would reduce the potential for wildland fire-related impacts to slickspot peppergrass populations and habitat as described under *Impacts from Wildland Fire Ecology and Management Actions*. Elimination of camping and staging areas for wildland fire suppression and rehabilitation in the ACEC would reduce the potential for human disturbance that would result in small-scale fragmentation of plant communities and increased potential for introduction and spread of noxious weeds and invasive plants. The effects of livestock grazing exclusion, motorized vehicle closure, and closure to mineral leasing and development would improve potential for success of habitat restoration treatments by reducing on-going disturbance and related introduction and spread of noxious weeds and invasive plants.

Actions prescribed under Alternative IV for the Jarbidge Foothills ACEC would indirectly protect special status plants and their habitats by limiting human and livestock disturbance. Alternative IV-B would protect 48% of the area of Alternative IV-A. Required use of weed-free forage and straw, designating camp areas within the ACEC, limiting motorized use to designated routes, and integrated treatment of noxious weeds and invasive plants would all reduce risk of fragmentation of special status plant habitats due to introduction and spread of noxious weeds and invasive plants. Prioritization of the ACEC for critical suppression would reduce the potential for wildland fire-related impacts to status plants and their habitats as described under *Impacts from Wildland Fire and Ecology Management Actions*. Management actions that specifically reduce disturbance of sage-grouse during breeding and nesting periods and for protection of habitat would likewise protect special status plants and their habitats during active growth periods for plants.

Impacts of actions prescribed under Alternative IV for the Lower Bruneau Canyon ACEC would be identical to those described for Alternative I.

Impacts from Management Specific to Alternative V

Impacts of actions prescribed under Alternative V for the Lower Bruneau Canyon ACEC would be identical to those described for Alternative I.

Effects of actions prescribed under Alternative V for the Middle Snake ACEC would be similar to those described for Alternative I, except that livestock grazing would be not allowed in the Asquena pasture. This would increase potential for special status plant habitat restoration and increased populations due to transplant and seeding for the entire ACEC.

Actions prescribed under Alternative V for the Sagebrush Sea ACEC would provide protection for special status plant populations and existing and restored habitats over about 70% of the planning area in Vegetation Management Areas B, C, and D. Specific direction to restore Davis peppergrass habitat would increase potential for long-term maintenance and increase of populations. Stipulations requiring use of only native species in vegetation treatments would reduce potential for competition from non-native perennial plants special status plants. Additional stipulations for treatment buffers and exclusion of aerial spraying for slickspot and Davis peppergrass would reduce potential for damage or death of plants due to herbicide application.

Reduction of livestock allocation to 10% to 20% and corresponding livestock infrastructure would promote the success of restoration treatments by minimizing post-treatment effects associated with livestock trampling and grazing (Stevens, 2004). Required use of weed-free forage and straw, designating camp areas within the ACEC, limiting motorized use to designated routes, and integrating treatment of noxious weeds and invasive plants would all reduce risk degradation of occupied and potential special status plant habitats due to introduction and spread of noxious weeds and invasive plants. Prioritization of the ACEC for critical suppression would reduce the potential for wildland fire-related impacts to status plants and their habitats as described under *Impacts from Wildland Fire Ecology and Management Actions*.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Actions prescribed under Alternative VI for the Upper Bruneau Canyon ACEC would provide general protection for special status plant species in the Bruneau Canyon and along the rims. Actions would tend to maintain native plant communities at the current acreage and condition would protect occupied and potential habitat. Designating camp areas outside the ACEC, limited motorized use to designated routes, and integrated treatment of noxious weeds and invasive plants would reduce risk of fragmentation of habitat or conversion of habitat to an annual dominated community. The prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of potential and occupied habitat. Placement of livestock facilities (e.g., fencing, salt, water) to draw livestock away from bighorn sheep habitat would protect native communities within the ACEC from concentrated use and would shift patterns of livestock use outside the ACEC providing further protection for special status plant habitat.

Actions prescribed under Alternative VI for the Lower Bruneau Canyon ACEC would promote restoration of annual and non-native plant communities to native shrubland. This would improve existing and expand

potential habitat for special status plants. Integrated treatment of noxious weeds and invasive plants and prioritization of the ACEC for critical wildland fire suppression would reduce the potential for loss of restored or existing habitat. The disallowance of surface disturbing activities would further protect vegetation communities with in the ACEC. This would improve existing and expand potential habitat for special status plants.

Actions prescribed under Alternative VI for the Sand Point ACEC would provide limited protection to special status plant habitat by limiting ground disturbing activities over less than 1,000 acres.

Summary of Direct and Indirect Impacts

Rankings on each alternative are intended to convey how well each alternative maintains or improves special status plant habitat based on the indicators. Rankings are for comparison purposes only and are not meant to be additive by alternative or to provide a measure of significance between alternatives.

Impacts from the No Action Alternative

The No Action Alternative ranked seventh for management of special status plants and their habitats. While the No Action Alternative would do little to restore potential habitat, it contains low levels of management for protection of existing populations. This includes indirect impacts from special management for bighorn sheep in the Bruneau-Jarbidge Area of Critical Environmental Concern (ACEC).

Overall, the No Action Alternative would result in minor adverse impacts to BLM Special Status plants.

Impacts from Alternative I

Alternative I ranked fifth for management of special status plants. This is due primarily to intermediate levels of habitat restoration and management that would reduce wildland fire-related impacts to special status plants and their habitats and prevent direct and indirect impacts due to cross-country motorized use and route densities. ACEC designations under Alternative I would provide intermediate levels of protective management. Protections for special status plants and their habitats would only occur along the Bruneau, Jarbidge, Middle Snake, and Salmon Falls Creek drainages; populations and habitats in the interior of the planning area would not receive this protective management.

Overall, Alternative I would result in minor beneficial impacts to BLM Sensitive plants.

Impacts from Alternative II

Alternative II would do the least to manage for special status plants and their habitats. This is due to low levels of habitat restoration combined with the highest amount and intensity of livestock use and impacts due to route densities. Critical wildland fire suppression priorities would do little to protect special status plants and their habitats. Under Alternative II there would be no ACEC designations and, therefore, no special management for special status plants and their habitats.

Overall, Alternative II would result in moderate adverse impacts to BLM Sensitive plants.

Impacts from Alternative III

Alternative III ranked sixth for management of special status plants and their habitats. This is due primarily to relatively high levels of habitat fragmentation due to management actions intended to reduce large, landscape-level wildland fires. Establishment of vegetated and unvegetated fuel breaks, combined with increased wildland fire suppression infrastructure, would break up contiguous blocks of special status plant habitats and create opportunities for introduction and spread of noxious weeds and invasive plants. Alternative III also contains reduced levels of noxious weed controls compared to the other action alternatives and focuses on fuels reduction. Improvement of routes to facilitate wildland fire suppression would also increase the potential for introduction and spread of noxious weeds and invasive plants. Critical wildland fire suppression priorities extend protections to non-native perennial communities and do not fully protect occupied and potential habitats for special status plants. ACEC designations under Alternative III would only manage special status plants and habitats along the Bruneau and Jarbidge Rivers and in an area two-thirds the size of that protected under Alternative I. Therefore populations and

habitats for special status plants throughout most of the planning area would not have elevated levels of management.

Overall, Alternative III would result in minor adverse impacts to BLM Sensitive plants.

Impacts from Alternative IV

Alternative IV-A ranked first in maintaining existing special status plant populations and maintaining or increasing occupied and potential habitats. This is due primarily to actions that actively restore habitats, including diversification of plant community composition to support pollinator species. While short-term impacts exist, Alternative IV as a whole would do the most to improve the quality of existing and potential habitats and prevent habitat degradation due to introduction and spread of noxious weeds and invasive plants. Management is included in Alternative IV-A to reduce wildland fire-related impacts to special status plants and their habitats and to prevent direct and indirect impacts due to cross-country motorized vehicle use and route densities. ACEC designations under Alternative IV-A would provide direct and indirect management for special status plants and their habitats throughout the planning area. Alternative IV-A was rated first for its ability to maintain or increase special status plant populations and their habitats. Alternative IV-B was rated third due to reduced acreages for special management associated with ACECs.

Overall, Alternative IV would result in moderate beneficial impacts to BLM Sensitive plants.

Impacts from Alternative V

Alternative V ranked second for management of special status plants. This is due primarily to the passive nature of restoration actions and noxious and invasive weed treatments, which would reduce acreage and increase length of time required for potential habitat restoration. Alternative V provided the greatest amount of active management to reduce wildland fire-related impacts to special status plants and their habitats, and to prevent direct and indirect impacts due to cross-country motorized vehicle use and route densities. ACEC designations under Alternative V would provide direct and indirect management for special status plants and their habitats on the most acreage of all the alternatives, and, thus, for the most special status plant species and populations.

Overall, Alternative V would result in minor beneficial impacts to BLM Sensitive plants.

Impacts from Alternative VI (Proposed RMP)

Alternative VI ranked fourth in maintaining existing special status plant populations and maintaining or increasing occupied and potential habitats. This is due primarily to actions that actively restore habitats, including diversification of plant community composition to support pollinator species and management that would reduce wildland fire-related impacts to special status plants and their habitats and prevent direct and indirect impacts due to cross-country motorized use and route densities. While short-term impacts exist, Alternative VI as a whole would do more than the No Action Alternative and Alternatives I, II, and III to improve the quality of existing and potential habitats for special status plants. The ACECs of Alternative VI only do more than Alternative II for the protection of occupied and potential habitats.

Overall, Alternative VI would result in minor beneficial impacts to BLM Sensitive plants.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Cumulative impacts for special status plants consist of incremental effects of the alternatives when added to other past, present, and reasonably foreseeable future actions. These effects can occur over a long period of time, resulting in the gradual changes to special status plants.

Because of similarities in geology, soils, and vegetation, the planning area and the following areas form the geographic boundary for the cumulative impact analysis area for special status plants: adjacent portions of the Burley, Bruneau, Shoshone, and Wells (NV) Field Offices, and Snake River Birds of Prey National Conservation Area; the South Hills Unit of the Sawtooth National Forest; and the Jarbidge

Ranger District of the Humboldt-Toiyabe National Forest. The area includes Federal, State, and private lands. The temporal scope of the analysis is approximately 20 years or the life of the plan.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect special status plants:

- Military Use,
- Wildland Fire Ecology and Management,
- Livestock Grazing, and
- Transportation and Travel.

These actions are described in the *Introduction* to this chapter.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Since live ordnance is no longer used at the military ranges, the current and future impacts to special status plants and their habitats from military activities are related to use of routes within the planning area for transport of vehicles, equipment, and personnel to and from the ranges. BLM also provides the military with wildland fire suppression assistance for wildland fires within the ranges under cooperative agreement. In the event of multiple ignitions, wildland fire suppression priorities within the planning area would be modified to provide suppression assistance. Although BLM has no control over these impacts, BLM actions that affect transportation and travel and wildland fire management, when added to the effects of military use, result in cumulative impacts to special status plants and their habitats. The US Air Force (USAF) performs monitoring on slickspot peppergrass populations to determine impacts from grazing, wildland fire, and rehabilitation treatments (CH2MHILL, 2008). This ongoing monitoring is complementary to techniques for monitoring slickspot peppergrass range wide and therefore provides additional information regarding effects of management activities.

Livestock grazing occurs on Juniper Butte Training Range and is administered by the USAF. Slickspot peppergrass is located on the Juniper Butte Training Range and is exposed to the impacts of USAF administered grazing. The total acreage available for grazing is 11,000 acres. A three pasture system is used that is grazed for a maximum of 60 days within a 90-day period from April 15 to July 15. There are several areas of Juniper Butte Training Range that are unavailable to grazing. These areas are the seven acre maintenance compound in the North Pasture, 172 acres of slickspot peppergrass exclosures and a 29 acre grazing study area in the Southeast Pasture, and eight acres of exclosures in the Southwest Pasture used for collecting seed. Up to 1,328 animal unit months are authorized each year under this grazing lease.

Past livestock grazing and wildland fires resulted in vegetation removal and, in some areas, replacement with annual or non-native perennial communities. This conversion has been extensive throughout the cumulative analysis area, particularly in areas where the elevation is less than 5,000 feet. Wildland fires and associated impacts to plant communities are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Under the No Action Alternative, the frequency and scale of wildland fire is expected to occur at current or increased levels. High suppression priorities for ignitions on military ranges would shift suppression efforts away from BLM-managed lands within the planning area or adjacent Federal, State, or private lands in the event of multiple incidents. This would result in local or large-scale decreases in remaining vegetation and special status plant habitats. Removal of livestock from burned public lands and shifting use elsewhere would result in potential for direct and indirect impacts to special status plants, primarily populations or habitats on State or private lands.

Twenty-five percent of the planning area would remain open to cross-country motorized vehicle use, users from surrounding areas with more restrictions (e.g., National Forests and the Snake River Birds of Prey National Conservation Area) would increasingly utilize the planning area, increasing potential damage or destruction of special status plants and their habitats in previously unused areas.

Cumulative Impacts from Alternative I

Cumulative impacts related to military lands would be the same as described for the No Action Alternative.

Cumulative impacts related to livestock grazing would be the same as described for the No Action Alternative.

Under Alternative I, cumulative impacts related to wildland fire would be due to upland vegetation treatments and wildland fire management actions that would increase vegetation resilience and reduce fire size. This would potentially reduce impacts of wildland fire and associated potential for wildland fire-related impacts to special status plants on adjacent Federal, State, and private lands.

Alternative I would increase the number of acres limited to designated routes and closed to motorized vehicle use within the cumulative analysis area. Restrictions in the planning area may result in increased impacts to special status plants and their habitats on adjacent Federal and State lands where cross-country motorized vehicle use is less restricted. Increased impacts to adjacent BLM lands would be short-term since the Bruneau, Burley, and Shoshone Field Offices are scheduled to prepare RMPs for their respective planning areas in the near future. The Humboldt-Toiyabe National Forest has finished their travel management planning process. According to current policy, transportation and travel allocations would substantially decrease the amount of areas open to cross-country motorized vehicle use.

Cumulative Impacts from Alternative II

Cumulative impacts related to military lands would be the same as described for the No Action Alternative.

Cumulative impacts related to livestock grazing would be the same as described for the No Action Alternative.

Cumulative impacts regarding potential impacts to special status plants and their habitats under Alternative II are expected to be similar to the No Action Alternative. Alternative II prioritizes the least acreage of all action alternatives for critical suppression and creates a landscape dominated by non-native perennial communities. While these plant communities are relatively resilient in the event of wildland fire, wildland fire management priorities would increase potential for wildland fire spread to adjacent Federal, State, and private lands. This would increase potential in those areas for wildland fire-related impacts to special status plants and their habitats.

Although no areas would be open to cross-country motorized vehicle use, the impacts to special status plants would be larger in scale due to the expected increase in route density associated with commercial operations. As with Alternative I, the lack of cross-country motorized vehicle opportunities would likely shift current use to adjacent Federal or State lands with fewer restrictions.

Cumulative Impacts from Alternative III

Cumulative impacts related to military lands would be the same as described for the No Action Alternative.

Cumulative impacts related to livestock grazing would be the same as described for the No Action Alternative.

Under Alternative III, cumulative effects of wildland fire management on special status plants and their habitats are expected to be slightly greater than Alternative I. Increases in wildland fire suppression infrastructure would reduce potential for wildland fire to spread to adjacent Federal, State, and private lands. However, the potential for degradation of existing habitats due to introduction and spread of noxious weeds and invasive plants would be greater. Cumulative impacts related to transportation and travel actions would be similar to Alternative I.

Cumulative Impacts from Alternative IV

Cumulative impacts related to military lands would be the same as described for the No Action Alternative.

Cumulative impacts related to livestock grazing would be the same as described for the No Action Alternative.

Under Alternative IV, cumulative impacts regarding wildland fire effects on special status plants and their habitats are expected to be slightly less than for Alternative I. This is due to greater acreage prioritized for critical suppression and reduced potential for wildland fire spread to adjacent Federal, State, and private lands. The cumulative effects of transportation and travel actions would be similar to Alternative I.

Cumulative Impacts from Alternative V

Cumulative impacts related to military lands would be the same as described for the No Action Alternative.

Cumulative impacts related to livestock grazing would be the same as described for the No Action Alternative.

Under Alternative V, cumulative impacts due to wildland fire effects on special status plants and their habitats would be lowest of all alternatives. Critical suppression priorities would reduce potential for impacts to special status plant populations on adjacent Federal, State, and private lands. Alternative V contains the most restrictive travel management allocations of all the alternatives. Therefore lack of cross-country motorized vehicle opportunities would likely shift current use to adjacent Federal or State lands with fewer restrictions.

Cumulative Impacts from Alternative VI (Proposed RMP)

Cumulative impacts related to military lands would be the same as described for the No Action Alternative.

Cumulative impacts related to livestock grazing would be the same as described for the No Action Alternative.

Under Alternative VI, cumulative impacts regarding wildland fire effects on special status plants and their habitats are expected to be slightly less than for Alternative I. This is due to greater acreage prioritized for critical suppression and reduced potential for wildland fire spread to adjacent Federal, State, and private lands. However, the potential for degradation of existing habitats due to introduction and spread of noxious weeds and invasive plants would be greater. The cumulative effects of transportation and travel actions would be similar to Alternative I.

4.3.7.2. Special Status Fish and Aquatic Invertebrates

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to special status fish and aquatic invertebrates (referred to as special status fish):

- **Riparian condition** – Riparian condition is generally determined by proper functioning condition (PFC) ratings. PFC is a qualitative assessment of the physical function of stream, wetland, lake, reservoir, and other areas associated with riparian-wetland vegetation. PFC ratings are based on hydrology, riparian vegetation, and the balance between erosional and depositional forces. PFC ratings are used to assess priority for riparian restoration.
    - The PFC ratings include: PFC, functioning at risk with an upward trend (FAR-UP), functioning at risk with no apparent trend (FAR-NA), functioning at risk with a downward trend (FAR-DN), and non-functioning (NF).

- **Habitat condition for special status fish species** – Habitat condition (HC) ratings were generated from BLM's 2005 and 2006 fisheries habitat data. HC ratings encompass streambank stability, streambank cover, stream substrate condition (including spawning fine sediments), water temperature (maximums for juvenile fish rearing), pool volume, pool quality, migration barriers, width-to-depth ratio, habitat complexity, and relative fish abundance. These entire instream habitat variables were evaluated and summarized into one HC rating for individual stream reaches (see Appendix D, Tables D-1 and D-2). These instream habitat features were selected because they have the greatest influence on the reproduction and survival of Interior Columbia River redband trout (redband trout) and Jarbidge River bull trout (bull trout) populations. Both of these species are broadly distributed throughout the planning area and are designated as special status species. Bull trout are Federally listed under the Endangered Species Act (ESA) as Threatened and their critical habitats have been designated by the US Fish and Wildlife Service. Redband trout are a Type 2 BLM Sensitive species. Results from the evaluation were used to identify stream reaches containing bull trout and/or redband trout in need of restoration (restoration reaches) and those needing to be protected as-is (conservation reaches). Stream reaches containing special status fish species would be a high priority for protection and improvement according to BLM Manual 6840. For streams that do not have HC data, PFC data were used as a surrogate for habitat condition for special status fish.

Methods and Assumptions

Impacts to special status fish and aquatic invertebrates from management in the following sections of Chapter 2 were analyzed in detail: *Special Status Species*, *Water Resources*, *Riparian Areas and Wetlands*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations*, *Minerals*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for special status species and aquatic invertebrates. Impacts from management for special status fish and aquatic invertebrates can be found under *Impacts from Special Status Species* in the *Tribal Rights and Interests*, *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Livestock Grazing*, *Transportation and Travel*, *Land Use Authorizations*, and *Leasable Minerals* sections.

The analysis does not discuss the impacts of management actions on various species of game fish which are present in Salmon Falls Reservoir, Cedar Creek Reservoir, and the Snake River (e.g., walleye, largemouth bass, small mouth bass, white crappie, black crappie, yellow perch, brook trout, rainbow trout, kokanee, and mountain whitefish). These fish species, most of which are not native to the planning area, are minimally impacted, if at all, by management actions on BLM lands.

The process of defining HC rating categories appropriate for the planning area included building a matrix that compared literature-supported habitat requirements for redband trout and bull trout to the BLM habitat data collected during a planning area-wide survey in 2006. Descriptions of bull trout and redband trout habitat condition indicators and thresholds, defining a range of habitat conditions, are included in the Aquatic and Riparian Management Strategy (Appendix D). These matrices allowed the identification of stream reaches that were functioning appropriately for fish, functioning with some level of risk to fish, or functioning at an unacceptable level for fish (Appendix D, Tables D-1 and D-2). The functional conditions for individual instream habitat variables were used to develop HC ratings. The BLM 2005 and 2006 stream survey data were used to identify habitats with the greatest relative fish abundance as a reference for good habitat condition and the habitats with the lowest relative fish abundance as a reference for poor habitat condition. The process of prioritizing stream reaches as conservation or restoration reaches is described in Appendix D; restoration reaches were assigned a further priority of high, moderate, or low. In general, 34% of the stream reaches were identified as conservation reaches, 18% were identified as high priority restoration reaches, 16% were identified as moderate priority restoration reaches, and 30% were identified as low priority restoration reaches (Appendix D).

Table 4-135. Instream Functional Habitat Condition Ratings for Bull Trout and Redband Trout Streams

Instream Functional Condition Class	HC Rating	Miles of Stream	Percent of Streams
Functioning Properly or Functioning at Risk	Conservation	18	34
Functioning at Risk	Restoration – High Priority	10	18
Functioning at Risk	Restoration – Moderate Priority	9	16
Functioning in an Unacceptable Condition [A]	Restoration – Low Priority	16	30
Total		**53**	**100**

[A] Includes stream miles in a degraded condition due to factors beyond BLM discretion (i.e., dewatered).

Table 4-136. Riparian Priority Ratings for Conservation and Restoration Reaches

HC Rating	Riparian Priority Rating	Miles
Conservation	Priority 1 (FAR-NA, FAR-DN)	13
	Priority 2 (FAR-UP, NF)	3
	Priority 3 (PFC)	1
Restoration – High Priority	Priority 1 (FAR-NA, FAR-DN)	2
	Priority 2 (FAR-UP, NF)	< 1
	Priority 3 (PFC)	8
Restoration – Moderate Priority	Priority 1 (FAR-NA, FAR-DN)	3
	Priority 2 (FAR-UP, NF)	2
	Priority 3 (PFC)	4
Restoration – Low Priority	Priority 1 (FAR-NA, FAR-DN)	5
	Priority 2 (FAR-UP, NF)	2
	Priority 3 (PFC)	7
Total		**50**

Table 4-137. Riparian Priority Ratings for Stream Reaches Containing Special Status Species Habitat without Habitat Condition Data

Riparian Priority Rating	Perennial Stream Miles without HC Data
Priority 1 (FAR-NA, FAR-DN)	52
Priority 2 (FAR-UP, NF)	55
Priority 3 (PFC)	65
Total Miles	**172**

The priorities for HC restoration reaches (i.e., high, moderate, low) were compared to the riparian PFC ratings (Priority 1: FAR-NA and FAR-DN; Priority 2: FAR-UP and NF; and Priority 3: PFC) to identify stream reaches needing improvement. Information on the riparian PFC designations and analysis process are in the *Riparian Areas and Wetlands* section.

For all action alternatives, the management objective for special status fish is to maintain or improve the quality and quantity[3] of special status species habitat by managing public land activities to sustain or benefit those species. For special status fish, this means maintaining conservation reaches that are properly functioning for fish and improving restoration reaches for fish survival and reproduction.

The effects analysis compares the relevant management actions under each alternative to the objective of maintaining the conservation reaches and improving the restoration reaches for special status fish and aquatic invertebrate species. Either the action contributes to attaining the objective, has a neutral effect,

[3] Quantity is not identified as an objective in Alternatives II and III.

or reduces the likelihood the objective will be achieved. Perennial stream miles were provided to establish a context for the miles of streams that have the potential to be affected by a specific land use allocation compared to the miles of streams with PFC or HC data that have the potential to be affected. The analysis was based on geographic information system-generated miles, which do not take into account topography or stream channel sinuosity (meander). The geographic information system miles can vary from the miles of stream estimated during field surveys. Stream miles were rounded to the nearest mile.

Management actions that have the potential to affect geothermal hot springs where the Bruneau hot springsnail occurs were considered in the analysis. The primary reasons for the decline of the Bruneau hot springsnail includes a reduction or loss of geothermal spring habitats resulting from the depletion of the regional geothermal aquifer underlying the Bruneau Valley area (FWS, 2002), which is due to actions on private lands that are beyond BLM discretion. Actions that would benefit Bruneau hot springsnail or their habitats on BLM-managed land, such as installing livestock grazing exclosure fences, have already been implemented to protect this species.

The following assumptions were used when analyzing effects of management actions on special status fish and aquatic invertebrates:

- Management actions that reduce, maintain, or improve PFC and HC ratings in habitats for special status fish and aquatic invertebrate species would have the same effects to native non-game fish habitat. For these reasons the analyses for special status fish and aquatic invertebrate species and native non-game fish have been combined.
- The goals, objectives, and management actions for water resources, riparian areas and wetlands, fish, and special status species would improve instream habitat conditions across the planning area in the long term. It is recognized that restoration activities would lead to localized negative impacts to stream habitats in the short term with beneficial impacts to habitat in the long term.
- For special status fish streams without HC data but with PFC data, management actions to improve PFC ratings would also improve habitat condition.
- Streams without both PFC and HC data would be affected by management actions in a similar manner as streams with condition data.
- The Bruneau River, Jarbidge River, and portions of Salmon Falls Creek have special designations that maintain these habitats in a high quality habitat condition that equates to management as a conservation reach.
- Any stream in an impaired condition would be identified for restoration or improvement within the limits of BLM discretion.
- Fish habitat attributes may vary spatially, but the analysis integrates the habitat attributes over the entire stream reach.
- In bull trout occupied streams, field surveys did not include the entire stream reach. Habitat condition in the surveyed reaches is assumed to approximate habitat condition for the entire reach.
- Management actions that pose a risk to PFC ratings for the Snake River would also pose a risk to Snake River snails and their habitat. Actions to improve PFC and HC ratings for the Snake River and its tributaries would maintain or improve habitats occupied by Snake River snails. These actions would also minimize the risk for land uses to threaten the continued survival and reproduction of Snake River white sturgeon and Shoshone sculpin.
- Management actions that pose a risk to geothermal springs would pose a risk to Bruneau hot springsnails and their habitat. Management actions implemented on public land as a result of ESA consultation have reduced the potential for adverse effects to Bruneau hot springsnail. Actions which improve PFC and HC along the Bruneau River and its tributaries, would maintain or improve habitats occupied by Bruneau hot springsnail (USFS et al., 2004).

Direct and Indirect Impacts

Impacts from Special Status Species Actions

Managing streams to maintain and promote the biological needs of special status fish and aquatic invertebrate species directly influences proper functioning condition (PFC) and habitat condition (HC)

ratings. Special status fish and aquatic invertebrate species require stable streams that are well vegetated with low instream fine sediments and cool water temperatures for survival and reproduction (Appendix D). Shaded stream areas are preferred habitats of juvenile trout (Platts, 1991). PFC is a minimal requirement for meeting the habitat requirements of special status fish and aquatic invertebrate species. The HC ratings go beyond the PFC ratings by addressing sediment, water temperature, fish abundance, and instream characteristics related to hydrological function (i.e., pool depth, maximum width, length, area, number/mile, and dominant substrate) relative to their importance for special status fish and native non-game fish.

There are 50 miles of streams that have both PFC and HC data, including 23 miles of Priority 1 reaches which are top priority for restoration activities. The PFC and HC ratings for streams with both types of data and their priorities for restoration are displayed in Table 4-136. Restoration priorities for streams containing special status species habitat that do not have HC data but have PFC data are displayed in Table 4-137.

The following indicators were used to analyze the impacts of Special Status Species actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes management direction to protect riparian and habitat conditions for special status fish and aquatic invertebrate species. Specific direction is provided for the Snake River below lower Salmon Falls Dam which would protect and maintain, to the extent possible, habitats occupied by special status aquatic snails. The 500-foot year-round occupancy restrictions for oil and gas exploration and development would reduce the potential for oil and gas exploration and development to reduce riparian condition relative to this use. A majority of the riparian areas in the Bruneau River and Jarbidge River Watersheds would be maintained under the management for eligible and suitable Wild and Scenic River segments, which would improve and maintain these riparian areas in a condition that fully supports the habitat requirements for species status aquatic species. Bull trout would continue to be protected through designated critical habitat, the designated Bruneau Jarbidge Rivers Wilderness, and the ongoing requirement for Endangered Species Act (ESA) Section 7 consultation on actions that may affect bull trout or their habitat. The No Action Alternative would maintain current habitat conditions for special status fish and aquatic invertebrate species.

The management direction in the No Action Alternative resulted in the habitat conditions for redband trout and bull trout that are displayed in Table 4-135. The table is based on the 2005 and 2006 BLM fisheries data, which were collected during surveys of 53 miles of fish-bearing streams. The Aquatic and Riparian Management Strategy (ARMS) contains a detailed summary of PFC ratings, limiting factors, and conservation and restoration reaches based on this stream survey data. The direction in the ARMS does not apply to the No Action Alternative; however, compliance with ESA consultations would minimize the potential for adverse effects to ESA-listed species and their habitats. BLM Sensitive species habitats would not have the same requirements as the ESA-listed species habitats but would benefit from actions to maintain and improve habitat for ESA-listed species.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The No Action Alternative and all action alternatives include direction to follow current conservation measures in biological opinions and letters of concurrence, which can be updated, revised, or replaced through future consultation with the US Fish and Wildlife Service (FWS). This direction would maintain or improve habitat conditions for aquatic species for which ESA consultation has been completed, such as bull trout and their designated critical habitat, Snake River snails (i.e., Bliss Rapids snail, Snake River physa), and Bruneau hot springsnail. This direction would reduce impacts to special status fish and aquatic invertebrate species and their habitat from BLM authorized and allowable uses over the life of the plan.

Impacts from Management Common to All Action Alternatives

All action alternatives include management direction to maintain or improve special status fish and aquatic species habitats. This is consistent with BLM policy to incorporate the Interior Columbia Basin Strategy and Aquatic Framework (USFS et al., 2004) and the Guidance for Developing Aquatic Conservation Strategies for BLM Resource Management Plans in the Interior Columbia Basin (USDI, 2008) into RMP revisions. Implementing the conservation and restoration priorities in the ARMS (Appendix D; Tables D-3, D-4, and D-5) would improve PFC and HC ratings and special status fish and aquatic invertebrate species habitat, over the life of the plan.

All action alternatives include specific management direction for ESA-listed or BLM Sensitive aquatic species, including completing ESA consultation with FWS prior to authorizing any action that may affect ESA-listed species or their habitat. Actions that would adversely affect any special status species would not be implemented without mitigation to reduce the potential for adverse effects. Management for all special status fish and aquatic invertebrate species would be conducted according to current conservation plans, ESA consultation documents, and other strategies for special status fish and aquatic invertebrate species (Appendix E). All action alternatives would use monitoring and adaptive management to reduce impacts to special status fish and aquatic invertebrate species and their habitats in the planning area. Uses and activities in BLM Sensitive species habitats would not have the same requirements as those in ESA-listed species habitats.

All action alternatives would include the use of best management practices to maintain and improve habitat for special status fish and aquatic invertebrate species (Appendix B); direction for implementing habitat improvement projects to reduce fragmentation in redband trout habitat and promote the recovery of bull trout and their designated critical habitat; and direction to work cooperatively with Federal and State agencies, private landowners, and companies to identify and mitigate threats to Snake River snails, white sturgeon, Shoshone sculpin, and Bruneau hot springsnail from BLM-managed lands. All of these actions are expected to improve PFC and HC ratings and reduce impacts to special status fish and aquatic invertebrate species over the life of the plan.

Impacts from Management Specific to Alternative I

Alternative I would improve 34 miles of restoration reaches and maintain 17 miles of conservation reaches. The restoration direction in the ARMS would be used to achieve riparian objectives of 145 miles of stream at PFC and 80 miles of stream to be moving toward PFC over the life the plan. Alternative I would have more miles of improvement in special status fish and aquatic invertebrate species habitat than the No Action Alternative and Alternative II, but less than Alternatives III, IV, V, and VI.

Impacts from Management Specific to Alternative II

Alternative II would improve 33 miles of restoration reaches and maintain 17 miles of conservation reaches. The restoration direction in the ARMS would be used to achieve riparian objectives of 85 miles of stream at PFC and 140 miles of stream to be moving toward PFC over the life of the plan. Alternative II is expected to have fewer miles of stream achieving PFC than the other action alternatives, but there would be more improvement in riparian conditions than would be expected for the No Action Alternative.

Impacts from Management Specific to Alternative III

Alternative III would improve 34 miles of restoration reaches and maintain 17 miles of conservation reaches. The restoration direction in the ARMS would be used to achieve riparian objectives of 183 miles of stream to be at PFC and 42 miles of stream to be moving toward PFC over the life of the plan. The priority areas for active restoration would be in habitats occupied by special status species which are broadly distributed across the planning area. Alternative III would have more miles of improvement in special status fish and aquatic invertebrate species habitat than the No Action Alternative and Alternatives I and II and the same amount as Alternatives IV, V, and VI. Some wildland fire-related actions, such as increasing the availability of water for wildland fire suppression or fuels treatments in Riparian Conservation Areas (RCAs), would locally reduce PFC and HC ratings, but compliance with ESA consultation requirements would minimize the potential for adverse effects to ESA-listed species and their habitats.

Impacts from Management Specific to Alternatives IV and VI (Proposed RMP)

Alternatives IV and VI, would improve 34 miles of restoration reaches and maintain 17 miles of conservation reaches. The restoration direction in the ARMS would be used to achieve riparian objectives of 183 miles of stream to be at PFC and 42 miles of stream to be moving toward PFC over the life of the plan. Stream reaches containing special status species or their habitat would be a high priority for active restoration. Alternatives IV and VI, would have the same miles of improvement in special status fish and aquatic invertebrate species habitat as Alternatives III and V, which is more than the No Action Alternative and Alternatives I and II. Active restoration activities in the RCA would be a priority for these alternatives. Active restoration would have more short-term adverse effects to PFC and HC ratings, but there is likely to be a faster rate of habitat recovery than would be expected for Alternative V which primarily focuses on passive restoration.

Impacts from Management Specific to Alternative V

Alternative V would improve 34 miles of restoration reaches and maintain 17 miles of conservation reaches. The restoration direction in the ARMS would be used to achieve riparian objectives of 183 miles of stream to be at PFC and 42 miles of stream to be moving toward PFC over the life of the plan. Stream reaches containing special status species would be a high priority for restoration. Active restoration would be limited to functioning at risk with a downward trend (FAR-DN) and non-functioning (NF) reaches. Alternative V would have the same miles of improvement in special status fish and aquatic invertebrate species habitat as Alternatives III, IV, and VI, which is more than the No Action Alternative and Alternatives I and II. The passive restoration techniques emphasized in this alternative would have fewer short-term adverse effects to special status fish and aquatic invertebrate species habitats and longer habitat recovery timeframes than expected for Alternatives IV and VI. In some cases, recovery may not be achieved if specific actions are needed to restore a habitat component that is no longer present (i.e., appropriate riparian vegetation) or to remove an impact to the stream channel (i.e., remove a culvert that is impairing streamflow). Passive restoration combined with fewer resource uses would improve PFC and HC ratings in the long term and improve habitat condition for special status fish and aquatic invertebrate species.

Impacts from Water Resources Actions

The planning area contains 427 miles of water quality impaired streams (417 miles in Idaho and 10 miles in Nevada). Of these water quality impaired streams, 182 miles are perennial. A summary of the water quality impaired streams is provided in the *Water Resources* section. Currently, 29 miles of water quality impaired stream have both proper functioning condition (PFC) and habitat condition (HC) data; of these, 20 miles are restoration reaches and 12 miles are Priority 1 or 2 for restoration. Except for Cougar Creek, all of the perennial water quality impaired streams are occupied by special status fish and aquatic invertebrate species.

Table 4-138. Water Quality Impaired Streams with Proper Functioning Condition and Habitat Condition Data

HC Rating	Riparian Priority Rating	Miles of Water Quality Impaired Stream
Conservation	Priority 1 (FAR-NA, FAR-DN)	5
	Priority 2 (FAR-UP, NF)	3
	Priority 3 (PFC)	1
Restoration – High Priority	Priority 1 (FAR-NA, FAR-DN)	< 1
	Priority 2 (FAR-UP, NF)	0
	Priority 3 (PFC)	3
Restoration – Moderate Priority	Priority 1 (FAR-NA, FAR-DN)	3
	Priority 2 (FAR-UP, NF)	2
	Priority 3 (PFC)	2
Restoration – Low Priority	Priority 1 (FAR-NA, FAR-DN)	5
	Priority 2 (FAR-UP, NF)	2
	Priority 3 (PFC)	2
Total		**29**

The following indicators were used to analyze the impacts of Water Resources actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

The objective for water resources is to maintain or improve water quality in accordance with Federal and State standards and to design and construct land treatments to maintain or improve water quality. This alternative includes general direction to design and construct facilities to minimize adverse impacts to water quality, which would prevent degradation of water quality. The No Action Alternative is expected to maintain or slightly improve PFC and HC ratings, which would maintain riparian and habitat conditions and water quality in streams containing special status fish and aquatic invertebrate species over the life of the plan.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The No Action Alternative and all action alternatives include management direction to maintain or improve water quality in accordance with Federal and State standards. This indirectly provides direction for managing water resources for special status fish and aquatic invertebrate species or their habitats. Compliance with Federal and State water quality standards meets the water quality needs of special status fish and aquatic invertebrate species.

Impacts from Management Common to All Action Alternatives

All action alternatives include management direction to maintain or improve water quality in streams containing special status fish and aquatic invertebrate species, fish-bearing streams, and water quality impaired streams. Management direction is also provided to implement the restoration direction in the Aquatic and Riparian Management Strategy (Appendix D, Tables D-3, D-4, and D-5) and best management practices (Appendix B) to promote the achievement of water resource objectives. BLM management activities that are a factor in not meeting water quality standards would be modified or suspended. This direction would contribute to the attainment of water quality standards at the watershed level, which would improve or maintain water quality in streams containing special status fish and aquatic invertebrate species. Maintaining water quality in streams currently not listed as having impaired water quality would also support the needs for special status fish and aquatic invertebrate species in the long term.

Impacts from Riparian Areas and Wetlands Actions

Riparian vegetation provides shade, stabilizes streambanks, reduces erosion, influences channel morphology (i.e., pools and riffles), provides habitat for insects, provides cover for fish, and can provide up to 50% of the stream's nutrient energy supply in the form of organic matter (Platts, 1991). The extent to which these characteristics are affected is determined by the diversity, density, and vigor of riparian vegetation (Platts, 1991).

Water temperature is directly influenced by streamside vegetation. Riparian vegetation reduces the intensity of incoming solar radiation and reduces radiant cooling during cold months, thereby buffering stream temperatures and creating the preferred habitats for juvenile trout (Platts, 1991).

Grasses and grass-like plants, especially the sod-forming types, stabilize streambanks and reduce erosion. As well-sodded banks gradually erode, they create undercuts that are important as hiding places for trout (Platts, 1991) and aquatic insects (Platts, 1991). Woody streamside vegetation provides habitat for terrestrial insects, which are important food for trout and other fish species. Research suggests that in rangeland streams of the western United States, terrestrial invertebrates are important prey resources for trout (Saunders and Fausch, 2007). Removal of streamside vegetation can affect the diet of fish by reducing production of terrestrial and aquatic insects (Platts, 1991). Vegetation also provides organic matter to the stream. Leaf litter and other organic material from terrestrial plants is a principal source of food for aquatic invertebrates that eventually become food for fish. The presence of sod-forming plant types and woody vegetation promotes the development of pools and the formation of gravel bars, which

balances erosion and deposition in the stream channel and promotes the development of quality fish habitat. These conditions are a component of habitat condition (HC) ratings and are conducive to good fish habitat. In conservation reaches, fish habitat is functioning properly.

The following indicators were used to analyze the impacts of Riparian Areas and Wetlands actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes direction to maintain or improve riparian habitat condition and identifies fish and riparian values as a high priority. Riparian and wetland habitat would have a high priority for protection and improvement according to national policy. Management actions in floodplains and wetlands include measures to preserve, protect, and, if necessary, restore their natural function. In general, the No Action Alternative would avoid uses in the riparian buffer zone, but there is limited direction for improving or restoring riparian condition over the life of the plan. The conditions of the riparian areas in the planning area, and the habitats they provide for special status fish and aquatic invertebrate species, are expected to be maintained under this management direction.

Impacts from Management Common to All Action Alternatives

All action alternatives include riparian area and wetland objectives to maintain or improve riparian condition using the priorities for restoration and the PFC and HC ratings displayed in Appendix D (Tables D-3, D-4, and D-5). Riparian area and wetland management for all alternatives would maintain or improve riparian conditions which would also maintain or improve habitat conditions for special status fish and aquatic invertebrate species. The rate of improvement in riparian condition would vary between alternatives according to the amount of authorized uses and activities and the passive or active restoration emphasis. The result of riparian management would be an improvement in riparian conditions for Priority 1 and 2 reaches and protection of Priority 3 reaches. For all action alternatives, active riparian restoration actions would result in short-term, localized impacts to riparian conditions, but riparian and habitat conditions would improve in the long term. All action alternatives would implement the Aquatic and Riparian Management Strategy (ARMS) to achieve riparian management objectives.

The ARMS provides direction to use adaptive management to reduce impacts on riparian areas and wetlands from BLM authorized uses and activities. Adaptive management is a continual process of planning, implementation, monitoring, and evaluation to adjust management strategies to meet clearly defined goals and objectives (Williams et al., 2009). This approach improves resource conditions by learning from management outcomes. By continually adjusting management strategies as needed, supported by monitoring or additional information, adaptive management would result in attainment of short- and long-term trends toward meeting PFC and HC objectives. Adaptive management provides the capability to respond quickly to monitoring data with consideration given to past season monitoring or preseason conditions. It also allows changes needed to meet long-term objectives of the RMP, including direction from the Endangered Species Act (ESA), Clean Water Act, and Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. Compliance with the direction would promote the long-term improvement in riparian conditions for streams occupied by special status fish and aquatic invertebrate species over the life of the plan.

All action alternatives include management actions to consider authorizing activities or facilities where long-term benefits outweigh short-term impacts to riparian vegetation and fish habitat and to remove non-essential human-made structures and objects that negatively impact floodplain function. Although short-term localized impacts to aquatic habitat would occur, these activities would be designed to improve special status fish and aquatic invertebrate species habitats and riparian conditions in the long term.

Impacts from Management Specific to Alternative I

Alternative I identifies stream reaches with habitat occupied or capable of supporting special status fish as a high priority for restoration, consistent with restoration priorities in the ARMS. The result would be

that the 85 miles of Priority 3 reaches would be maintained at PFC, 60 miles of Priority 1 reaches would achieve PFC, and 80 miles of Priority 1 and 2 reaches would be moving toward PFC over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. Alternative I is expected to have more improvement in riparian and habitat conditions than the No Action Alternative and Alternative II, but less than Alternatives III, IV, V, and VI.

Impacts from Management Specific to Alternative II

Alternative II identifies fish-bearing stream reaches as a high priority for restoration, consistent with restoration priorities in the ARMS. The emphasis areas for restoration projects would generally occur in the Jarbidge River Watershed and tributary streams in the Jarbidge Foothills. The restoration direction in the ARMS would be used to achieve riparian and wetland objectives of 85 miles of stream at PFC and 140 miles of stream to be moving toward PFC over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. Alternative II is expected to have fewer miles of stream achieving PFC than the other action alternatives, but there would be more improvement in riparian and habitat conditions for streams containing special status fish and aquatic invertebrate species than would be expected for the No Action Alternative.

Impacts from Management Specific to Alternative III

Alternative III identifies stream reaches with the potential to serve as wildland fire breaks as a high priority for restoration, consistent with restoration priorities in the ARMS. The result would be that 85 miles of Priority 3 reaches would be maintained at PFC, 77 miles of Priority 1 reaches and 21 miles of Priority 2 reaches would achieve PFC, and the remaining 42 miles of Priority 2 reaches would be moving toward PFC over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. Alternative III would have more miles of improvement in special status fish and aquatic invertebrate species habitat than the No Action Alternative and Alternatives I and II and the same amount as Alternatives IV, V, and VI. Some wildland fire-related actions, such as increasing the availability of water for wildland fire suppression or fuels treatments in the Riparian Conservation Area (RCA), would locally reduce PFC and HC ratings, but compliance with ESA consultation requirements would minimize the potential for negative impacts to ESA-listed species and their habitats.

Impacts from Management Specific to Alternative IV

Stream reaches containing special status species or their habitat would be a high priority for active restoration, consistent with restoration priorities in the ARMS. Active restoration would be limited to PFC Priority 1 and 2 reaches. The result of this management would be that 85 miles of Priority 3 reaches would be maintained at PFC, 77 miles of Priority 1 reaches and 21 miles of Priority 2 reaches would achieve PFC and 42 miles of Priority 2 reaches would be moving toward PFC over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. Alternative IV would have the same miles of improvement in special status fish and aquatic invertebrate species habitat as Alternatives III, V, and VI, which is more than the No Action Alternative and Alternatives I and II. Active restoration activities in the RCA would be a priority for this alternative. Active restoration would have more short-term adverse impacts to PFC and HC ratings, but there is likely to be a faster rate of habitat recovery than would be expected for Alternative V which primarily focuses on passive restoration.

Impacts from Management Specific to Alternative V

Stream reaches containing special status species or their habitat would be a high priority for restoration, consistent with restoration priorities in the ARMS. Active restoration would be limited to functioning at risk with a downward trend (FAR-DN) and non-functioning (NF) reaches. Alternative V would have approximately 140 miles of Priority 1 and 2 reaches improved over the life of the plan, but only 30 miles of the FAR-DN would be improved through active restoration. Any other improvements would occur through passive restoration or as a result of habitat recovery due to fewer authorized uses on the public land. Alternative V would have the same miles of improvement in special status fish and aquatic invertebrate species habitat as Alternatives III, IV, and VI, which is more than the No Action Alternative and Alternatives I and II. Active restoration would be limited to FAR-DN and NF reaches which would result in

a slower rate of recovery in areas where only passive restoration is used. The passive restoration techniques emphasized in this alternative would have fewer short-term adverse effects to special status fish and aquatic invertebrate species habitats and longer habitat recovery timeframes than would be expected for Alternatives IV and VI.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, stream reaches containing special status species or their habitat would be a high priority for active restoration, consistent with restoration priorities in the ARMS. Active restoration would be limited to PFC Priority 1 and Priority 2 restoration reaches. The direction in the ARMS would be used to meet the same miles of riparian areas and wetlands objectives as described for Alternatives III, IV, and V. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. The result of this direction is that more miles of riparian and habitat improvement would occur over the life of the plan than under the No Action Alternative and Alternatives I and II. Active restoration activities in the RCA would be a priority for this alternative. Active restoration activities would have more short-term adverse impacts to PFC and HC ratings, but there is likely to be a faster rate of habitat recovery than would be expected for Alternative V which primarily focuses on passive restoration.

Impacts from Noxious Weeds and Invasive Plants Actions

Noxious weeds and invasive plants are often the first colonizers of disturbed areas. These species lack deep root systems, which stabilize streambanks and maintain narrow stream channels. Noxious weeds and invasive plants can replace native vegetation (e.g., juniper encroachment prevents aspen and willow regeneration). Noxious weeds and invasive plants can also alter soil stability, promote erosion, and affect the accumulation of leaf litter or other soil resources. When noxious weed infestations occur in upland and riparian areas, they can result in a buildup in hazardous fuels, which increases wildland fire frequency, severity, duration, which ultimately impacts aquatic species. All of these factors result in a reduction in habitat condition (HC) ratings.

In aquatic systems, noxious weeds and invasive plants can clog slow-moving water bodies and create an overabundance of organic material. Dense concentrations of invasive aquatic plants also reduce light and dissolved oxygen levels, decreasing the quality of habitat available for special status fish and aquatic invertebrate species.

A variety of chemicals can be used to reduce the spread of noxious weeds and invasive plants on public lands that can be detrimental to the survival, growth, reproduction, or behavior of fish or aquatic species (Norris et al., 1991). Biological treatments, such as the use of targeted grazing, can be used to reduce or control the spread of invasive plants. Although livestock can be used to control vegetation, they can also potentially have additional effects on riparian areas and wetlands and aquatic organisms (see *Impacts from Livestock Grazing Actions*). Where noxious weeds invade riparian areas and wetlands, proper functioning condition (PFC) and HC ratings decline, and the maintenance or attainment of quality fish habitat is less likely to occur.

The following indicators were used to analyze the impacts of Noxious Weeds and Invasive Plants actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

Noxious weeds and invasive plants are expected to be maintained or continue to increase in riparian habitats over time. This alternative includes management direction to follow conservation measures in relevant biological opinions and letters of concurrence for noxious weed and invasive plant treatments, as appropriate. Management plans for Areas of Critical Environmental Concern and other special designations, and current BLM policy for noxious weed and invasive plant treatments would also be followed. This provides direction for riparian areas occupied by Endangered Species Act (ESA)-listed species and BLM Sensitive species, but not for all riparian areas in the planning area. Compliance with

the terms and conditions in biological opinions issued by the US Fish and Wildlife Service would minimize the potential for effects from noxious weed and invasive plant treatments to affect riparian areas containing special status fish and aquatic invertebrate species. Noxious weed treatments in riparian areas occupied by special status fish and aquatic invertebrate species are expected to reduce the potential for noxious weeds to increase to levels that would reduce PFC ratings. The management provided in the No Action Alternative is not expected to promote the attainment of objectives for Priority 1 and 2 reaches due to the expected increase in noxious weeds and invasive plants in Riparian Conservation Areas (RCAs). There also is no management direction for the treatment of invasive aquatic plants, such as hydrilla, or other invasive plant species known to occur in the planning area, which would pose an increased risk to habitats for special status fish and aquatic invertebrate species.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All alternatives include management direction to follow applicable laws, policies, label instructions for the application of herbicides, and the current programmatic vegetation treatment EIS direction, currently the Record of Decision for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (BLM, 2007b). The methods of control in or near riparian areas and wetlands would be adjusted to minimize impacts to riparian areas and wetlands as well as water quality, which would also reduce impacts to special status fish and aquatic invertebrate species. Best management practices for noxious weed and invasive plants would be incorporated into BLM management activities and authorized uses as appropriate (Appendix B). Following direction in the Record of Decision for the Vegetation Treatments EIS would mitigate the potential for impacts to riparian areas containing special status fish and aquatic invertebrate species due to noxious weed and invasive plant treatments.

All alternatives would also comply with the Clean Water Act, which would provide direction to ensure chemicals that would harm non-target riparian vegetation and water quality would not be used in a manner that would have short- or long-term effects on riparian areas containing special status fish and aquatic invertebrate species.

Impacts from Management Common to All Action Alternatives

For all action alternatives, the management direction for riparian areas and aquatic resources would be used to reduce the potential for noxious weed treatments to adversely affect non-target vegetation in RCAs containing special status fish and aquatic invertebrate species. The management is expected to promote the attainment of riparian and wetland objectives which would also reduce the risk for noxious weed treatments to negatively affect special status fish and aquatic invertebrate species or their habitat. It would also reduce the risk for noxious weeds and invasive plants to increase in RCAs to levels which would result in a loss of riparian plant species which are necessary to maintain aquatic resource conditions.

Noxious weed and invasive plant treatment methods can generally be described as chemical, mechanical, manual, or biological. When these treatments are used in riparian areas, their potential to affect aquatic species and their habitats vary by the method used, the amount and type of vegetation treated, the amount of soil disturbed, the proximity of the treatment to water, and a variety of other factors (BLM, 2007b). Maintaining the native vegetation in RCAs is critical to maintaining properly functioning riparian and habitat conditions in fish-bearing streams. Noxious weed and invasive plant treatments in the RCA would enhance conditions as long as mitigation is applied to reduce effects to the extent possible. The short-term, potentially negative effects to special status species are less than allowing noxious weeds and invasive plants to displace native riparian vegetation over the long term.

Impacts from Management Specific to Alternative I

Chemical, mechanical, and biological treatments and targeted grazing would be used to treat 250,000 acres of noxious weeds. The emphasis areas would include RCAs occupied by special status fish and aquatic invertebrate species, recreation access points, and special designations.

The use of targeted grazing would locally reduce PFC and HC ratings where this use is authorized in habitats occupied by special status fish and aquatic invertebrate species. The level of reduction of these

ratings would depend upon the grazing intensity, timing, and the current condition of the habitat occupied by special status fish and aquatic invertebrate species. Although the purpose of the treatment would be to reduce noxious weeds in the RCA, livestock would also browse native hydric species such as willows, carex, and sedges. This livestock use could locally reduce PFC and HC ratings prior to meeting the desired objectives for reducing noxious weeds and invasive plants. Direct impacts to special status fish and aquatic invertebrate species from the trampling of their eggs may also occur if the targeted grazing treatment occurs during important spawning periods. Managing riparian areas at their potential would discourage the spread of invasive plants due to dense woody and herbaceous vegetation. Targeted grazing in upland areas to reduce noxious weed infestation would have minimal effects to special status species habitats as long as livestock do not enter riparian areas as part of the treatment.

Impacts from Management Specific to Alternative II

Chemical, mechanical, and biological methods, as well as targeted grazing and prescribed fire, would be used to treat 250,000 acres of noxious weeds and invasive plants. The emphasis areas for noxious weeds and invasive plant treatments would include RCAs occupied by special status fish and aquatic invertebrate species. The effects of noxious weed and invasive plant treatments on PFC and HC ratings in habitat occupied by special status fish and aquatic invertebrate species would be the same as described in Alternative I. The potential effects from using targeted grazing to reduce noxious weeds and invasive plants in RCAs would be the same as described for Alternative I.

Alternative II differs from Alternative I in that prescribed fire would be used to treat noxious weeds and invasive plants in RCAs. Prescribed fire has similar effects on the landscape as wildland fire, although the potential to reduce PFC and HC ratings would be less pronounced because prescribed fires are planned ignitions and are conducted with specific project objectives (e.g., intensity, acreages, and weather conditions). The use of prescribed fire in riparian areas containing special status fish and aquatic invertebrate species would locally reduce PFC and HC ratings because the fire would also remove non-target vegetation. The general effect of fire on riparian areas and special status fish and aquatic invertebrate species and their habitats are described under *Impacts from Wildland Fire Ecology and Management Actions*. Compliance with the riparian and wetland objectives would minimize the potential for PFC and HC ratings to be reduced from using prescribed fire to control noxious weeds and invasive plants in RCAs; the use of prescribed fire is compatible with the objectives for riparian recovery.

Impacts from Management Specific to Alternative III

Chemical, mechanical, and biological methods, as well as targeted grazing and prescribed fire, would be used to treat 200,000 acres of noxious weeds and invasive plants. There would be the same number of acres of noxious weeds treated under Alternative III as Alternative VI which is the least of all alternatives. Treating fewer acres is expected to result in an incremental increase in noxious weeds and invasive plants in RCAs over time. The emphasis areas for noxious weed and invasive plant treatments would include special designations, fuel breaks, roadsides, and special status species habitat. The effects of noxious weed and invasive plant treatments on PFC and HC ratings in RCAs occupied by special status fish and aquatic invertebrate species would be similar to Alternative I. The potential effects to special status fish and aquatic invertebrate species from using targeted grazing and prescribed fire to reduce fuels in RCA would be the same as described for Alternatives I and II, respectively.

Impacts from Management Specific to Alternative IV

There would be 450,000 acres of noxious weed and invasive plant treatments, the largest number of acres treated of all alternatives. The emphasis for noxious weeds and invasive plants would include special designations, riparian areas, special status species habitat, and native plant communities. Chemical, mechanical, and biological methods, as well as targeted grazing and prescribed fire, would be used for treatments. The effects of these treatments on PFC and HC ratings in RCAs occupied by special status fish and aquatic invertebrate species would be the same as Alternatives I and II, except more acres would be affected.

Impacts from Management Specific to Alternative V

There would be 300,000 acres of noxious weed and invasive plant treatments which is fewer acres of noxious weed and invasive plant treatments than Alternative IV, but more than the No Action Alternative

and Alternatives I, II, III, and VI. The emphasis areas and treatment methods would be the same as described for Alternative IV, except targeted grazing would not be used. The effects of these treatments on PFC and HC ratings in RCAs occupied by special status fish and aquatic invertebrate species would be the same as described for Alternatives I and II; however, there would be no impacts related to targeted grazing under this alternative.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Chemical, mechanical, and biological methods, as well as targeted grazing and prescribed fire, would be used to treat 200,000 acres of noxious weeds and invasive plants. There would be the same number of acres of noxious weeds treated under Alternative VI as Alternative III which is the least of all alternatives. Treating less acres is expected to result in an incremental increase in noxious weeds and invasive plants in RCAs over time. The emphasis areas for noxious weed and invasive plant treatments would include special designations, motorized recreational access points, riparian areas, special status species habitat, roadsides and native plant communities. The effects of noxious weed and invasive plant treatments on PFC and HC ratings in RCAs occupied by ESA-listed species would be the same as for Alternative I. The potential effects from using targeted grazing and prescribed fire to reduce fuels in RCA would be the same as Alternatives I and II, respectively.

Impacts from Wildland Fire Ecology and Management Actions

Wildland fires play an important role in renewing upland and riparian landscapes. The intensity of wildland fires varies across the landscape, with a mix of low to moderate severity and lesser amounts of high burn severity (Gresswell, 1999). The potential effects of wildland fire on trout habitat vary according to the location of the fire (e.g., headwaters, lower stream reaches), fuels, burn severity, and the amount of the watershed burned. A study on the Boise National Forest found the principal effect of wildland fire was to embed the substrate with fine sediments. Where high severity wildland fire removed the overstory canopy or shade adjacent to streams, increased exposure to sunlight in the riparian area was observed (Burton, 2005). Post-fire floods can rejuvenate stream habitats by importing large amounts of gravel, cobble, woody debris, and nutrients to the stream. Subsequent spring floods scoured the substrates and transported most of the fine sands into the floodplain, resulting in higher fish productivities than before the wildland fire (Burton, 2005).

Smaller, disconnected fish populations are at a higher risk of extirpation due to uncharacteristic wildland fire because of their isolation. Reducing the risks of uncharacteristic wildland fire can provide benefits to isolated fish populations until connectivity or habitat quality is restored. In some cases, habitats completely devoid of trout just after debris floods were later re-colonized with migrants returning from downstream or nearby tributary rearing habitats (Burton, 2005). Similar findings were reported by Rieman and others (1997), who found, in the case of uncharacteristic wildland fires, local extirpation of fish is apparently short-term and patchy, recolonization is potentially rapid, and habitats disrupted immediately after the flood events are often rejuvenated in five to ten years. Habitat restoration, barrier removal, and other management actions to reduce wildland fire risks may have short-term risks associated with fine sediment production that may temporarily reduce fish survival and reproduction. These risks would be outweighed by long-term improvements in fish habitat and connectivity. Projects to reduce the risks of uncharacteristic wildland fire balance short-term risks against long-term benefits to fish (Burton, 2005). Larger, well-connected fish populations are at lower risk of extirpation due to uncharacteristic wildland fire (Rieman and Clayton, 1997).

Fire suppression activities can have both beneficial and detrimental effects on aquatic ecosystems (Gresswell, 1999; Rieman and Clayton, 1997). Detrimental impacts from these activities would include loss of riparian vegetation, soil disturbance in the riparian areas that results in sedimentation of streams, introduction of toxic substances (e.g., fire retardants, petroleum products) into water resources, and the loss of streamflows as a result of removing water from fish-bearing streams for suppression efforts. However, wildland fire suppression activities can benefit fish habitats by preventing the burning of high quality fish habitats. Wildland fire, wildland fire suppression, and fuels treatments can increase instream fine sediments, reduce streambank stability, remove riparian vegetation, and reduce fish population connectivity. All of these are variables directly influence habitat condition (HC) ratings.

Emergency stabilization and burned area rehabilitation (ES&BAR) activities, such as drill seeding, hand or mechanical planting, installation of water bars, fire line rehabilitation, and other activities, would reduce sediment contributions to fish-bearing streams and expedite the recovery of vegetation in the burned areas and improve HC ratings.

Critical suppression areas represent the highest suppression priority to reduce wildland fire size and acres burned and are prioritized by Vegetation Management Area (VMA) when multiple ignitions occur. Alternatives that identify critical suppression for habitats used by special status fish and aquatic invertebrate species would minimize the potential for proper functioning condition (PFC) and HC ratings to be reduced in these habitats. Conditional suppression areas, which represent areas of lower suppression priority based on the resource values and a desired fire role in the ecosystem, may result in unsuppressed wildland fire in Riparian Conservation Areas (RCAs) with short- and long-term effects to special status fish and aquatic invertebrate species and their habitat. In conditional suppression areas, restoration reaches not at PFC are more at risk for a prolonged reduction in condition rating from the impacts of wildland fire than those streams and riparian areas that are conservation reaches and at PFC. The effectiveness of including restoration reaches in critical suppression areas is dependent on accessibility by fire personnel, but in general there is less risk to a further reduction in HC rating when streams are included in critical suppression areas.

Table 4-139. Perennial Streams in Critical and Conditional Suppression Areas by Vegetation Management Area by Alternative (Miles)

VMA	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Critical Suppression Areas							
A	38	32	32	38	38	33	38
B	98	27	72	89	89	144	82
C	40	8	34	35	33	62	39
D	39	21	32	91	66	95	41
Total	**215**	**88**	**170**	**253**	**226**	**304**	**200**
Conditional Suppression Areas							
A	1	7	7	2	2	6	2
B	23	94	49	32	32	7	39
C	22	54	28	27	29	0	22
D	56	74	64	4	29	0	54
Total	**102**	**229**	**148**	**65**	**92**	**13**	**117**

[A] The No Action Alternative does not identify critical or conditional suppression areas.

Table 4-139 identifies the miles of perennial streams in critical and conditional suppression areas by VMA. Table 4-140 identifies the miles of conservation and restoration reaches in critical suppression areas in VMAs C and D by alternative. Bull trout and redband trout do not occur in VMAs A or B, so HC data were not collected in these VMAs. Prioritizing VMAs A or B for suppression would generally not benefit bull trout or redband trout, however, the unoccupied but designated critical habitat for bull trout in the lower Bruneau River would benefit from being included in a critical suppression area. The miles of riparian priority reaches in critical suppression areas are displayed in the *Riparian Areas and Wetlands* section.

Table 4-140. Conservation and Restoration Reaches in Critical Suppression Areas by Alternative (Miles)

HC Rating	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Conservation	12	9	9	18	18	18	13
Restoration	17	9	15	35	21	35	17
Total	**29**	**18**	**24**	**53**	**39**	**53**	**30**

[A] The No Action Alternative does not identify critical suppression areas.

Local water sources are used for wildland fire suppression. Water developments for wildland fire suppression include water storage tanks, draft sites, hydrants off pipelines, and enlarging stock water and surface water storage ponds. The general effects of diverting surface flows from fish-bearing streams would depend upon their proximity to the occupied habitat, the amount of water used, and the rate and time of year surface waters are diverted (see *Impacts from Water Resources Actions*). The development of new draft sites from fish-bearing streams would locally reduce PFC and HC ratings by affecting streamside vegetation, streambanks, streambed fine sediments, pool quality, and streamflow. The use of impounded waters (e.g., stock ponds, storage tanks, reservoirs) for wildland fire suppression would likely have a minor impact on special status fish and aquatic invertebrate species because these habitats are not occupied by special status fish and aquatic invertebrate species. Hydrants would result in a short-term reduction to streamflows in special status species habitats during the hot summer months when streamflows are already reduced or at base flows. The use or expansion of stock water and other water storage ponds within RCAs would locally reduce PFC and HC ratings by reducing instream flows, creating a barrier to migration, introducing sediments, and concentrating livestock in the RCA. Stock water ponds in upland areas would have less potential to affect fish-bearing habitats in RCAs.

Special status fish and aquatic invertebrate species can be negatively impacted if surface flows are diverted during important spawning periods or if proper containment or screening is not used to prevent juvenile fish from being drawn into pump intakes. Water quality can also be reduced where petroleum products are used to operate water pumps in the RCA. The riparian and aquatic resource management objectives for wildland fire suppression would reduce the potential for impacts to special status fish and aquatic invertebrate species to the extent possible.

Road improvements in the RCA can have both beneficial and negative impacts to stream habitats. The primary impact of roads on streams is from sediment contributions that exceed the stream's ability to transport the additional fine sediments. This sediment can imbed in stream substrates and have a variety of detrimental effects to fish-bearing streams (see *Impacts from Transportation and Travel Actions*). Improved road surfacing, road realignment away from fish-bearing streams, improved road drainage, or replacing damaged or removed riparian vegetation would reduce sediment contributions to streams where roads are present in the RCA. These improvements would benefit fish-bearing streams and riparian habitat. Road improvements in upland areas to reduce response times for wildland fire suppression would have minimal impacts to fish-bearing streams as long as proper drainage is provided to discourage sediment from being transported into streams. Conversely, some of these improvements would improve access for wildland fire suppression, reducing impacts to RCAs containing special status fish and aquatic invertebrate species habitat due to wildland fire.

Improved stream crossings would have positive effects to streams if undersized culverts are replaced with culverts that can accommodate greater flood flows or if culverts that pose a barrier to fish passage are replaced with open bottom culverts or bridges. Road crossings would also be designed to allow for water withdrawals for wildland fire suppression so additional channel disturbance is not created to obtain water. These improvements would have localized impacts to RCAs but would support the riparian areas and wetlands objectives if impacts to RCAs are localized and fewer miles of special status fish and aquatic invertebrate species habitat are impacted by wildland fire.

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would pose the third least risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. The No Action Alternative manages the planning area for full suppression of all wildland fires. Large wildland fires and human-caused fire are expected to continue due to factors that are beyond human control (i.e., drought conditions, weather, and availability of flashy fuels). Within the Bruneau-Jarbidge Rivers Wilderness and

Wild and Scenic River (WSR) designations, wildland fire suppression tactics would not impair Wilderness or WSR values, which would also avoid impacts to special status fish and aquatic invertebrate species and their habitat within these areas. Outside of these special designations, the No Action Alternative provides general management direction for wildland fire suppression, fuels treatments, and ES&BAR relative to protecting watershed and riparian conditions. This management direction is expected to reduce wildland fire suppression-related impacts to PFC and HC ratings which would reduce impacts to special status fish and aquatic invertebrate species.

Impacts from Management Common to All Action Alternatives

All action alternatives would use the goals, objectives, and management actions for water resources, riparian areas and wetlands, fish, and special status species to reduce impacts from wildland fire suppression in riparian areas and wetlands and to meet the habitat needs for special status fish and aquatic invertebrate species. The potential for short- and long-term impacts to riparian areas would still occur due to wildland fire; however, the effects from suppression activities on special status fish and aquatic invertebrate species would be reduced.

All action alternatives include management direction to use minimum impact suppression tactics to avoid wildland fire suppression-related impacts to streams and other surface water resources. Site-specific mitigation, such as drafting water from streams in a manner that does not cause localized dewatering, using screens when drafting water from fish-bearing streams, and avoiding the placement of fueling, staging, and other wildland fire suppression support areas in RCAs would minimize the potential for wildland fire suppression activities to reduce PFC and HC ratings in streams containing special status fish and aquatic invertebrate species.

All action alternatives would include fuels treatments to reduce the threat for wildland fire to impact the wildland urban interface (WUI). Fuels treatments in riparian areas would have short-term impacts to riparian and habitat conditions but may result in long-term improvements in riparian vegetation in areas that are not at PFC. Degraded riparian areas may not respond in a similar manner because they tend to burn with greater severity and take longer to recover. The goals, objectives, and management actions for riparian areas, best management practices (BMPs), and Endangered Species Act (ESA) consultation would reduce the potential for fuels treatments to impact riparian areas containing special status species. Rest from authorized uses such as livestock grazing and recreational uses would further promote the recovery of RCAs after fuels treatments.

A variety of mechanical, chemical, and manual methods would be used to restore vegetation and stabilize soils in burned areas. The Aquatic and Riparian Management Strategy (ARMS), BMPs, and compliance with ESA consultations where required would reduce impacts to special status fish and aquatic invertebrate species and their habitats from ES&BAR projects. Some localized short-term effects would occur, but a reduction in PFC and HC ratings for streams containing special status fish and aquatic invertebrate species or their habitats are not expected from these treatments. These actions are expected to reduce the long-term impacts of wildland fire on special status fish and aquatic invertebrate species and their habitat.

Compliance with ESA consultation would reduce the potential for impacts to ESA-listed species from obtaining water for wildland fire suppression from occupied habitats. Compliance with the riparian areas and wetlands objectives, restoration priorities in the ARMS, and BMPs, would minimize the potential for impacts to redband trout due to wildland fire suppression-related actions within the RCA.

Impacts from Management Specific to Alternative I

Alternative I would pose the fourth most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. Alternative I identifies the WUI; the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, and Salmon Falls Creek Areas of Critical Environmental Concern (ACECs); and key sage-grouse habitat as critical suppression areas and all other areas as conditional suppression areas. VMA C has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. Of the 316 miles of perennial streams in the planning area, 215 miles would be in critical suppression areas and 102 would

be in conditional suppression areas. There are 17 miles of restoration reaches and 12 miles of conservation reaches in critical suppression areas. .

The Bruneau-Jarbidge ACEC includes a majority of the designated critical habitat for bull trout, except for approximately eight miles of designated critical habitat for bull trout in the West Fork of the Jarbidge River, Dave Creek (a tributary to the East Fork Jarbidge River) and in the lower Bruneau River. Designating this ACEC as a critical suppression area and using the restoration direction in the ARMS, BMPs, and ESA consultation during wildland fire suppression activities would reduce the potential for PFC and HC ratings to be reduced in designated critical habitat for bull trout and redband trout habitat in the ACEC. Some riparian areas may burn, locally affecting bull trout or redband trout habitat and potentially resulting in short- or long-term reductions to PFC and HC ratings. Wildland fires in these areas would likely introduce sediment to the stream and input large woody debris that would ultimately improve PFC and HC ratings in the long term. Fish populations in the ACEC are connected to other quality habitats, so the threat of species isolation due to wildland fire is less of a concern than for isolated fish populations. Portions of this ACEC are in each VMA.

The Lower Bruneau Canyon ACEC contains 80% of the geothermal springs in the planning area occupied by Bruneau hot springsnail. Critical wildland fire suppression in this area, combined with using the ESA consultation requirements and BMPs to minimize effects to occupied habitats, would reduce the potential for wildland fire suppression efforts to impact Bruneau hot springsnail. Habitats used by these snails would be negatively impacted if the habitat was to burn, but the critical suppression emphasis would reduce the amount of habitat burned to the extent possible. This ACEC is in VMA A, which has the lowest priority for wildland fire suppression during multiple ignitions in Alternative I.

The Middle Snake ACEC is adjacent to approximately 11 miles of the Snake River occupied by a BLM Sensitive fish (white sturgeon), two ESA-listed aquatic snails (Snake River physa, Bliss Rapids snail) and three BLM Sensitive aquatic snails (California floater, Columbia pebblesnail, Short-face lanx). The identification of this area as a critical suppression area, combined with using ESA consultation requirements and BMPs to minimize the impacts of wildland fire on occupied habitats, would reduce the potential for wildland fire or wildland fire suppression activities to impact these species. This ACEC is in VMA A, which has the lowest priority for wildland fire suppression during multiple ignitions in Alternative I.

This alternative includes actions for improving water availability for wildland fire suppression. The development of new draft sites from fish-bearing streams would locally reduce PFC and HC ratings. Conversely, improved water availability would likely reduce the miles of special status fish and aquatic invertebrate species habitat impacted by wildland fire.

Alternative I would improve existing roads and stream crossings to enhance access for wildland fire suppression. Building new roads into RCAs would result in increased impacts to fish-bearing streams and locally reduce PFC and HC ratings. As these new roads and stream crossings are created, the potential for increased use by other public land users would have an additive effect to PFC and HC ratings in RCAs. As with improving water availability, improving roads and stream crossings would likely reduce the miles of special status fish and aquatic invertebrate species habitat impacted by wildland fire.

The building of new infrastructure for wildland fire suppression in the RCA would result in long-term impacts to PFC and HC ratings due to the increase amount of ground disturbance in RCAs. This increased level of ground disturbance would be maintained over the life of the plan and would pose an increased risk for long-term impacts to riparian areas containing special status fish and aquatic invertebrate species. However, the localized impacts to RCAs from these structures would likely be out weighted by the reduced likelihood for habitat used by special status fish and aquatic invertebrate species to be impacted by wildland fire.

Actions to reduce the risk for wildland fire by reducing the amount of fine vegetative fuels would include targeted livestock grazing in RCAs, similar to those described for Alternative I under *Impacts from Noxious Weeds and Invasive Plants Actions*. In general, using livestock to treat fuels in RCAs would increase the amount of livestock browsing on non-target native hydric species and would pose an increased risk to reduce PFC and HC ratings within the treatment area. Targeted grazing would be

expected to increase impacts to RCAs, particularly in VMAs B and D which contain the majority of Priority 1 and 2 and restoration reaches in the planning area. The use of temporary infrastructure, such as fences and water sources outside of the RCA, would reduce but not completely eliminate the potential for impacts to special status fish and aquatic invertebrate species within the treatment areas.

Impacts from Management Specific to Alternative II

Alternative II would pose the most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. Alternative II identifies the WUI as a critical suppression area and all other areas as conditional suppression areas. VMA A has the highest priority for wildland fire suppression during multiple ignitions, while VMA B has the second highest priority. Critical suppression areas would encompass 88 miles of perennial stream, and conditional suppression areas would encompass 229 miles of perennial stream. There are nine miles of restoration reaches and nine miles of conservation reaches in critical suppression areas. Critical suppression areas contain 34 miles of Priority 1 and 2 reaches. Alternative II has the fewest miles of perennial stream in critical suppression areas of all alternatives, posing the most risk for impacts to special status fish and aquatic invertebrate species habitat of all alternatives. Alternative II would have the fewest miles of conservation and restoration reaches in critical suppression areas of all alternatives.

Water developments, roads and stream crossings, and building new roads in areas with limited access, would have the same impacts to special status fish and aquatic invertebrate species as described for Alternative I. These would improve the effectiveness of suppressing wildland fire in critical suppression areas.

This alternative would have fewer areas with special status fish and aquatic invertebrate species habitat (88 miles) in critical suppression areas than in Alternative I (215 miles). The designated critical habitat for bull trout and redband trout habitat in the Jarbidge River and its East Fork would be in critical suppression areas, reducing the potential for impacts to PFC and HC ratings from wildland fire. There would be an increased potential for a reduction in PFC and HC ratings due to wildland fire in redband trout habitats in the Jarbidge Foothills streams and Salmon Falls Creek and in white sturgeon and Snake River snail habitats in the Snake River, as these areas are in conditional suppression areas.

Prescribed fire and targeted grazing would be used as tools to reduce fuels. The impacts from using targeted grazing for fuels treatments are similar to those described for Alternative I. The impacts from using prescribed fire for fuels treatments are similar to those described for Alternative II under *Impacts from Noxious Weeds and Invasive Plants Actions*.

Impacts from Management Specific to Alternative III

Alternative III would pose the second most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. Alternative III identifies the WUI; the Bruneau-Jarbidge and Salmon Falls Creek ACECs; and key sage-grouse habitat as critical suppression areas and all other areas as conditional suppression areas. Both of the ACECs contain habitat occupied by bull trout and redband trout. VMA B has the highest priority for wildland fire suppression during multiple ignitions, while VMA A has the second highest priority. Critical suppression areas would encompass 170 miles of perennial stream, and conditional suppression areas would encompass 148 miles of perennial stream. There are 15 miles of restoration reaches and 9 miles of conservation reaches in critical suppression areas. Critical suppression areas contain 57 miles of Priority 1 and 2 reaches. This alternative would have the second fewest miles of perennial streams and conservation and restoration reaches in critical suppression areas of all alternatives; more than Alternative II but less than the other alternatives.

The effects of critical and conditional suppression areas on HC ratings would be similar to those described for Alternative I, although fewer conservation and restoration reaches would be in critical suppression areas. Alternative III would have the most wildland fire suppression-related infrastructure (e.g., roads, water developments) of all alternatives. This would result in soil disturbance entering streams containing special status fish and aquatic invertebrate species and locally reduce PFC and HC ratings. Locating guard stations, airstrips, and helipads in upland areas where they do not pose a threat to PFC

and HC ratings is expected to avoid impacts to special status fish and aquatic invertebrate species and their habitats. These actions may result in fewer miles of special status fish and aquatic invertebrate species habitat being impacted by wildland fire due to improve response times for wildland fire suppression.

The impacts from increased water developments would be the same as described for Alternative I. The development of new pipelines would have additional impacts to PFC and HC ratings in RCAs if they are developed from habitats occupied by special status fish and aquatic invertebrate species. These developments would have localized disturbance to streamside vegetation, streambeds, and streambank stability. There also may be a localized short-term reduction in streamflows as additional water is removed from the stream, although riparian areas and wetlands direction is expected to reduce the potential for these impacts. Compliance with ESA consultation requirements, riparian areas and wetlands objectives for wildland fire suppression, and BMPs would reduce impacts to special status fish and aquatic invertebrate species where water is withdrawn for wildland fire suppression.

The impacts of improving existing roads would be similar to those described for Alternative I. This alternative would have the greatest number of new and improved roads to facilitate wildland fire suppression of the action alternatives. Some of these new roads or road-related improvements would be in RCAs occupied by special status fish and aquatic invertebrate species. New roads in uplands would likely have a minor impact on riparian habitats as long as BMPs are used to minimize off-site surface erosion to RCAs. Roads constructed in the RCA and any other road-related improvements would be constructed using the riparian areas and wetlands objectives, supported by the restoration direction in the ARMS (Appendix D) to reduce impacts to special status fish and aquatic invertebrate species and their habitats. Site-specific and short-term effects to PFC and HC ratings from wildland fire-related road improvements are expected to occur. However, to be consistent with the ARMS, these actions would have to improve habitat conditions in the long term. New roads in uplands would be expected to improve the response time for wildland fire suppression which would reduce the potential for riparian areas containing special status fish and aquatic invertebrate species to be impacted by wildland fire.

Fuels treatments would occur at the landscape scale and would include targeted grazing and prescribed fire. These fuels treatments would have similar effects to PFC and HC ratings as described for Alternatives I and II.

Impacts from Management Specific to Alternative IV

Alternative IV would pose the second least risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. Alternative IV identifies the WUI; the Bruneau-Jarbidge, Inside Desert, Jarbidge Foothills, and Lower Bruneau Canyon ACECs; and key sage-grouse habitat as critical suppression areas and all other areas as conditional suppression areas. VMA C has the highest priority for wildland fire suppression during multiple ignitions while VMA D has the second highest priority. Critical suppression areas would encompass 253 miles and 226 miles of perennial stream in Alternatives IV-A and IV-B, respectively. Conditional suppression areas would encompass 65 miles and 92 miles of perennial stream in Alternatives IV-A and IV-B, respectively. Critical suppression emphasis for the Jarbidge Foothills ACEC would include more redband trout habitat in Alternative IV-A than in Alternative IV-B. There are 35 miles of restoration reaches in critical suppression areas in Alternative IV-A and 21 miles in Alternative IV-B; in both sub-alternatives, there are 18 miles of conservation reaches in critical suppression areas. Critical suppression areas contain 95 miles of Priority 1 and 2 reaches in Alternative IV-A and 74 miles of Priority 1 and 2 reaches in Alternative IV-B. Except for the No Action Alternative, Alternative IV would have the second most miles of perennial streams in critical suppression areas; less than for Alternative V but more than the other alternatives. It would have the same miles of conservation and restoration reaches in critical suppression areas as Alternative V, which is the most of all alternatives. As in other action alternatives, there would be an increased emphasis on improving water sources, roads and stream crossings, and other infrastructure to enhance wildland fire suppression, with similar effects. The impacts from constructing new guard stations would be the same as described for Alternative III. The effects of increasing the number and type of water developments, improving existing roads and stream crossing, and constructing new roads and crossings would be the same as described for Alternative I.

Fuels treatments would occur at the landscape scale and would include targeted grazing and prescribed fire. These fuels treatments would have similar effects to PFC and HC ratings as described for Alternatives I and II.

Impacts from Management Specific to Alternative V

Alternative V would pose the least risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. Alternative V identifies the WUI; the Lower Bruneau Canyon, Middle Snake, and Sagebrush Sea ACECs; and key sage-grouse habitat as critical suppression areas and all other areas as conditional suppression areas. VMA C has the highest priority for wildland fire suppression during multiple ignitions in Alternative V, while VMA B has the second highest priority. Critical suppression areas would encompass 304 miles of perennial stream and conditional suppression areas would encompass 13 miles of perennial stream. There are 35 miles of restoration reaches and 18 miles of conservation reaches in critical suppression areas. Critical suppression areas contain 138 miles of Priority 1 and 2 reaches. Alternative V would have the most miles of perennial stream and conservation and restoration reaches within critical suppression areas of all alternatives. Alternative V would have the least wildland fire suppression infrastructure and watershed disturbance of all action alternatives. Critical suppression for the Lower Bruneau Canyon and Middle Snake would have the same effects to PFC and HC ratings as described for Alternative I. Water developments would be maintained at their current levels, which would result in fewer disturbances to PFC and HC ratings and streamflows but pose an increased risk for wildland fire to impact RCAs containing special status fish and aquatic invertebrate species. The effects of road and stream crossing improvements would similar to but less than Alternative I.

Critical suppression in the Sagebrush Sea ACEC would encompass 259 miles of the 316 perennial streams miles in the planning area. The ACEC would include all occupied habitat for bull trout and all 24 redband trout streams in the planning area but would not include the entire designated critical habitat for bull trout (e. g., lower Bruneau River). Fire suppression activities in occupied and designated critical habitat for bull trout would be conducted according to existing ESA consultation. Although portions of bull trout habitat would be impacted by wildland fire, the suppression emphasis and tactics are expected to reduce the potential for wildland fire and wildland fire suppression to reduce PFC and HC ratings to the extent practical. The riparian areas and wetlands objectives for wildland fire suppression would be used to reduce impacts on redband trout and their habitat. These habitats would be impacted by wildland fire and wildland fire suppression activities when there is an urgent need to protect structures and public safety.

Maintaining water availability at current levels would result in more RCA acres burned by wildland fire. Improvements in roads and stream crossings in the RCA would create areas to obtain water for wildland fire suppression in areas already impacted by roads or stream crossings. The Sagebrush Sea ACEC is a large and continuous geographic area (956,000 acres) and likely contains areas with structures or resources that are of lower value than other areas in the planning area. Identifying such a large area for critical suppression may limit wildland fire suppression options during intense wildland fire activity when flexibility with suppression resources is needed to most effectively manage wildland fires.

Fuels treatments would occur at the landscape scale and would include prescribed fire. The impacts from using prescribed fire for fuels treatments would be similar to those described for Alternative II.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would pose the third most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wildland fire. Alternative VI identifies the WUI; the Lower Bruneau Canyon, Salmon Falls Creek, Sand Point, and Upper Bruneau Canyon ACECs; designated critical habitat for bull trout; and the sage-grouse management area as critical suppression areas and all other areas as conditional suppression areas. It would have the same priority for wildland fire suppression during multiple ignitions as Alternative I. Critical suppression areas would encompass 200 miles of perennial stream, and conditional suppression areas would encompass 117 miles of perennial stream. There are 17 miles of restoration reaches and 13 miles of conservation reaches in critical suppression areas; one mile more than for Alternative I. Critical suppression areas

contain 58 miles of Priority 1 and 2 reaches. Alternative VI would have the third fewest miles of riparian area containing special status fish and aquatic invertebrate species in critical suppression areas of all alternatives; more than Alternatives II and III but less than the other alternatives.

The effects of critical and conditional suppression areas on conservation and restoration reaches would be similar to those described for Alternative I, but the amount of improvements would be most similar to Alternative III. The impacts of Alternative VI on special status fish and aquatic invertebrate species would be similar to Alternative III; more than would be expected for Alternatives IV and V.

The impacts from increased water developments would be the same as described for Alternative I. Compliance with the riparian areas and wetlands objectives for wildland fire suppression, ESA consultation requirements, and BMPs would reduce impacts to special status fish and aquatic invertebrate species where water is withdrawn for wildland fire suppression. The impacts from new and improved roads to facilitate wildland fire suppression would be the same as described for Alternatives I and III.

Fuels treatments would occur at the landscape scale and would include targeted grazing and prescribed fire. These fuels treatments would have similar effects to PFC and HC ratings as described for Alternatives I and II.

Impacts from Livestock Grazing Actions

Livestock grazing can alter the riparian vegetation along the stream and can reduce proper functioning condition (PFC) and habitat condition (HC) ratings. In areas grazed by livestock, stream channels contain more fine sediment, streambanks are more unstable, and streambanks are less undercut than in ungrazed areas (Platts, 1991). These channel alterations decrease the depth and number of pools, reducing the physical space available for rearing fish, and can adversely affect all life stages of fish and other aquatic life (Furniss et al., 1991). Streamside vegetation stabilizes the streambank and shades the stream, influencing water temperature. Shaded stream areas are the preferred habitats of juvenile trout (Platts, 1991). Once the stream has been heated, riparian shading merely limits further heating.

Riparian vegetation also plays an important role in rebuilding streambanks by trapping fine sediments during flood events. As sediment-laden floodwaters rise up and then over the streambank, flexible streamside vegetation such as willows and grasses is flattened into mats that hug the streambank and adjacent ground (Platts, 1991). Livestock grazing, if allowed to deplete vegetation, can accelerate streambank erosion (Platts, 1991). When animals graze directly on streambanks, mass erosion from trampling, hoof slide, and streambank collapse causes soil movement directly into the stream (Platts, 1991). These instream and riparian processes are components of PFC and HC ratings.

Fencing streams to exclude livestock grazing is a widely used approach for restoring stream habitats (Platts, 1991). Properly constructed and maintained exclosure fences protect riparian vegetation and streambanks from livestock grazing and other resource uses (i.e., recreation, transportation and travel). Research shows that riparian areas quickly improve when they are fenced to exclude grazing, but stream morphology improves slowly, and fish populations may or may not be improved (Platts, 1991). In areas excluded from livestock grazing, changes in stream channels are associated with an increase in channel depth and decrease in the width-to-depth ratio, which is strongly associated with high quality habitat for fishes, particularly trout. Platts (1991) found that once grazing ceased, streambanks rebuilt rapidly, and stream width was significantly narrower inside a rested exclosure than in stream reaches outside the exclosure. Although there is limited research on the changes in fish populations resulting from exclosures, one study indicated a strong preference for excluded stream reaches by trout less than one year old, most likely in response to potential food supply and cover related to increased riparian vegetation (Bayley and Li, 2008).

Trailing across streams can cause localized streambank alterations and sediment to stream channels in proportion to the amount of time livestock are present within the Riparian Conservation Area (RCA). Impacts to the RCA from supervised livestock trailing events are less than unsupervised trailing where livestock linger along stream channels or within the stream. If trailing occurs in the summer months,

riparian banks are not saturated and are less prone to shearing by hoof impacts. Livestock trailing through the RCA and into the uplands can also be a source of fine sediment to stream channels over time.

Table 4-141 identifies the perennial stream miles available and unavailable for livestock grazing by alternative. Table 4-142 displays the PFC and HC ratings for areas available for livestock grazing.

Table 4-141. Perennial Streams in Areas Available and Unavailable for Livestock Grazing by Alternative (Miles)

Allocation	Alternative							
	No Action	I	II	III	IV[A]		V	VI
					IV-A	IV-B		
Available for Livestock Grazing	125	94	111	111	96	97	58	100
Unavailable for Livestock Grazing	192	224	206	206	221	220	260	217

[A] The only difference between Alternatives IV-A and IV-B is one mile of stream in Clover Creek.

Table 4-142. Proper Functioning Condition and Habitat Condition Rated Reaches in Areas Available for Livestock Grazing by Alternative (Miles)

Stream Type	Alternative						
	No Action	I	II	III	IV	V	VI
PFC Rated Reaches							
Priority 1 and 2	105	80	93	93	80	57	83
HC Rated Reaches							
Conservation	11	6	6	6	6	< 1	6
Restoration	23	22	22	22	19	7	22
Total	**34**	**28**	**28**	**28**	**25**	**8**	**28**

The following indicators were used to analyze the impacts of Livestock Grazing actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 1,412,000 acres of the planning area would be available for livestock grazing, which would be the most acres available to grazing of all alternatives. It would allocate between 160,000 to 260,000 animal unit months (AUMs) for livestock at full implementation. A total of 125 miles of perennial stream would be in areas available for livestock grazing, and 192 miles of perennial stream would be in areas unavailable for livestock grazing. There would be 23 miles of restoration reaches in areas available for grazing. Of the streams unavailable for grazing, 34 miles are Priority 1 and 2 reaches. The No Action Alternative has the most miles of restoration reaches, perennial streams, and Priority 1 and 2 reaches in areas available for grazing of all alternatives. It would rank fourth in the number of authorized AUMs at full implementation of the alternatives; less than Alternatives II, III, and VI but more than the other alternatives.

Approximately five riparian exclosures were created to exclude livestock under the No Action Alternative. Riparian conditions within these exclosures are expected to continue to improve over time.

Impacts from Management Common to All Action Alternatives

Livestock grazing would comply with the riparian areas and wetlands goals, objectives, and management actions to improve riparian condition. Management actions would be used in grazing authorizations and operating plans to adjust livestock grazing in areas identified as priority areas for improvement based on PFC and HC ratings displayed in the Aquatic and Riparian Management Strategy (ARMS; Appendix D,

Tables D-3, D-4, and D-5). This management is expected to improve PFC and HC ratings in stream reaches containing special status fish and aquatic invertebrate species where livestock grazing is reducing riparian and habitat conditions.

Impacts from Management Specific to Alternative I

In Alternative I, 1,389,000 acres of the planning area would be available for livestock grazing which are the fifth most acres available to grazing of all alternatives. These areas include 94 miles of perennial streams. Livestock grazing would not be authorized on 74,000 acres, including 224 miles of perennial streams. There would be 22 miles of restoration reaches available for livestock grazing; the same as for Alternatives II, III, and VI. Alternative I would authorize an approximate range of 179,000 to 245,000 AUMs for livestock grazing at full implementation, which is the fifth most of all alternatives. Alternative I, would have more miles of Priority 1 and 2 reaches in areas available to livestock grazing than Alternative V, the same as Alternative IV, but fewer than the other alternatives.

Riparian reference areas would encompass approximately 3,000 acres. Riparian reference areas would locally improve PFC and HC ratings and benefit special status fish and aquatic invertebrate species within the reference areas.

Livestock grazing would not occur in RCAs in the Jarbidge River and its East Fork, but would occur in tributaries to these designated critical habitats for bull trout. Except for redband trout habitat in riparian reference areas, livestock would have access to all redband trout streams in the Jarbidge Foothills. Livestock grazing in these areas would pose an increased risk for impacts to redband trout due to grazing-related impacts to PFC and HC ratings. Livestock would not have direct access to special status species habitats in the lower Bruneau River and the Snake River due to existing Endangered Species Act consultation requirements. The restoration priorities in the ARMS (Appendix D, Tables D-3, D-4, and D-5) and best management practices (BMPs) would be applied to grazing allotments and would reduce the impacts of grazing on special status fish and aquatic invertebrate species and their habitats.

Temporary non-renewable (TNR) permits issued in RCAs would be consistent with the riparian areas and wetlands objectives and restoration priorities in the ARMS, which would require PFC and HC ratings to be maintained or improved by actions authorized in the RCA. Livestock have an increased tendency to consume woody vegetation late in the grazing season after the herbaceous vegetation has cured. Issuing TNR permits late in the grazing season would pose an increased risk to woody vegetation along streams occupied by special status fish and aquatic invertebrate species. These habitats may be affected by issuing TNR permits in upland areas, unless upland water sources are provided and temporary fencing is used to prevent livestock from accessing RCAs with special status fish and aquatic invertebrate species. The application of site-specific use standards would be applied to ensure RCA condition for streams containing special status fish and aquatic invertebrate species is maintained or improved relative to TNR permit authorizations.

Impacts from Management Specific to Alternative II

In Alternative II, 1,408,000 acres of the planning area would be available for livestock grazing which is the second most acres available to grazing of all alternatives. These areas include 111 miles of perennial streams. Livestock grazing would not be allowed on 59,000 acres, including 206 miles of perennial streams. There would be 22 miles of restoration reaches available for livestock grazing which is the same as Alternatives I, III, and VI. Alternative II would authorize an approximate range of 362,000 to 440,000 AUMs for livestock grazing at full implementation, which is the most of all alternatives. Alternative II would have fewer miles of Priority 1 and 2 streams in areas available to livestock grazing than the No Action Alternative but the same miles as Alternative III, which is more miles than the other alternatives.

Riparian reference areas would encompass approximately 1,000 acres. Riparian reference areas would locally improve PFC and HC ratings and benefit special status fish and aquatic invertebrate species within the reference areas.

The impacts of this alternative on special status fish and aquatic invertebrate species would be similar to those described for Alternative I, except more miles of special status fish and aquatic invertebrate species

habitat would be available for grazing. The additional stream miles available for livestock grazing would be along Clover Creek and the Snake River. The riparian areas and wetlands objectives, restoration direction in the ARMS, and BMPs would be applied to grazing allotments and would reduce the impacts of grazing on special status fish and aquatic invertebrate species. This alternative would pose the most risk for impacts to PFC and HC ratings in RCAs containing special status fish and aquatic invertebrate species due to livestock grazing.

Reserve common allotments would be selected based on special management concerns, such as whether riparian areas contained special status fish and aquatic invertebrate species and whether the area can sustain grazing use without significant resource impacts. The restoration direction in the ARMS would be used to maintain or improve PFC and HC ratings within these allotments. The impacts of issuing TNR permits in riparian areas occupied by special status fish and aquatic invertebrate species in Alternative II would be the same as described for Alternative I.

Impacts from Management Specific to Alternative III

Alternative III authorizes livestock grazing on slightly fewer acres (1,407,000 acres) than Alternative II (1, 408,000), but both alternatives affect nearly the same number of stream miles and the same special status species habitats; 111 miles of perennial stream would be available and 206 miles would be unavailable for livestock grazing. Livestock grazing would not be allowed on 56,000 acres, including 206 miles of perennial streams. There would be 22 miles of restoration reaches available for livestock grazing; the same as for Alternatives I, II, and VI. Alternative III would authorize an approximate range of 276,000 to 348,000 AUMs for livestock grazing at full implementation, which is the second most of all alternatives. The miles of Priority 1 and 2 reaches in areas available for livestock grazing would be the same as Alternative II.

Riparian reference areas would encompass approximately 1,000 acres; the same as Alternative II. The benefits of the riparian reference areas to special status fish and aquatic invertebrate species are the same as Alternative II.

The impacts of issuing TNR permits on riparian areas occupied by special status fish and aquatic invertebrate species would be the same as described for Alternative I. The impacts of creating reserve common allotments on special status fish and aquatic invertebrate species would be the same as described for Alternative II.

Impacts from Management Specific to Alternative IV

Alternatives IV-A and IV-B would have 1,324,000 and 1,355,000 acres of the planning area available for livestock grazing, which is the second least acres available to grazing of all alternatives. These areas include 96 and 97 miles perennial streams, respectively. The only difference between Alternatives IV-A and IV-B is one mile of stream in Clover Creek being unavailable for livestock grazing in Alternative IV-A but available in Alternative IV-B. There are 19 miles of restoration reaches available for livestock grazing; the second fewest of all alternatives. Livestock grazing would not be allowed on 139,000 acres, including 221 miles of perennial streams in Alternative IV-A and 108,000 acres, including 220 miles of perennial streams in Alternative IV-B.

Alternative IV-A would authorize an approximate range of 78,000 to 123,000 AUMs for livestock grazing at full implementation. Alternative IV-B would authorize an approximate range of 81,000 to 127,000 AUMs for livestock grazing at full implementation. Alternative IV would have the second fewest AUMs at full implementation of all alternatives. Alternative IV, would have more miles of Priority 1 and 2 reaches in areas available to livestock grazing than Alternative V, the same as Alternative I, but fewer than the other alternatives.

Riparian reference areas would encompass approximately 3,000 acres; the same as Alternatives I and VI. The benefits to special status fish and aquatic invertebrate species would be the same for these alternatives.

The impacts of issuing TNR permits in riparian areas occupied by special status fish and aquatic invertebrate species would be the same as described for Alternative I. The impacts of creating reserve

common allotments on special status fish and aquatic invertebrate species would be the same as described for Alternative II.

Impacts from Management Specific to Alternative V

In Alternative V, 1,160,000 acres of the planning area would be available for livestock grazing which is the least acres available of all alternatives. These areas include 58 miles of perennial streams. Livestock grazing would not be allowed on 303,000 acres, including 260 miles of perennial streams. There would be seven miles of restoration reaches available for livestock grazing which is the least of all alternatives. Alternative V would authorize an approximate range of 42,000 to 85,000 AUMs for livestock grazing at full implementation, which is substantially less than all other alternatives. This alternative has the fewest miles of perennial streams, restoration reaches and priority reaches containing special status fish and aquatic invertebrate species in areas open to livestock grazing of all alternatives.

Riparian reference areas would encompass approximately 23,000 acres, which is the most of all alternatives. Alternative V would have the most benefits to special status fish and aquatic invertebrate species from creating reference areas of all alternatives.

Areas unavailable for livestock grazing would include most of the designated critical habitat for bull trout, most of the redband trout habitat, and the entire Bruneau hot springsnail habitat. The level of livestock use under this alternative would be substantially less than under the other alternatives. This alternative is expected to result in the most improvement in PFC and HC condition and would have the greatest benefit to special status species habitat relative to livestock grazing of any of the alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 1,406,000 acres of the planning area would be available for livestock grazing, which is the similar to Alternatives II and III. These areas include 100 miles of perennial streams. Livestock grazing would not be allowed on 57,000 acres, including 217 miles of perennial streams. There would be 22 miles of restoration reaches available for livestock grazing; the same as Alternatives I, II, and III.

Alternative VI would authorize an approximate range of 186,000 to 279,000 AUMs for livestock grazing at full implementation, which is third most of all alternatives. The areas available for grazing include 83 miles of Priority 1 and 2 reaches; less than the No Action Alternative and Alternatives II and III, but more than the other alternatives.

Riparian reference areas would encompass approximately 3,000 acres, which is the same as for Alternatives I and IV. The benefits to special status fish and aquatic invertebrate species would be the same for all three alternatives; more than for Alternatives II and III.

The impacts of issuing TNR in riparian areas occupied by special status fish and aquatic invertebrate species would be the same as described for Alternative I. The impacts of creating reserve common allotments on special status fish and aquatic invertebrate species would be the same as described for Alternative II.

Impacts from Recreation Actions

Recreation impacts to habitat condition (HC) ratings are primarily related to the reduction or removal of riparian vegetation and the compaction of riparian soils. Streamside vegetation directly affects fish cover, food, and streambank stability and also provides shade, resulting in the cool waters favored by trout. Large woody debris in the stream is an important habitat component of a healthy stream. Woody debris removal by swimmers, boaters, anglers, and other recreators can be significant over time at recreation areas that receive substantial use. Some locations along the Snake River have seen a reduction in riparian vegetation as recreators remove woody vegetation for campfires. Similar effects have occurred in localized areas along some redband trout streams. Recreators can also have localized direct effects to water quality by introducing chemicals, such as bathing and dish washing soaps, into fish-bearing streams (Meehan, 1991). Fecal coliform bacteria can be a source of water contamination, primarily at dispersed recreation sites, where human waste facilities are not provided (Clark and Gibbons, 1991).

Reservoirs and impounded waters, such as those found in Salmon Falls Creek and along the Snake River, are popular areas for motorized boating. Power boats can have numerous negative impacts on lake and reservoir environments, including shoreline erosion and suspension of fine sediments. Outboard engines can also introduce hydrocarbons emissions that are toxic to aquatic organisms into the aquatic environment. Power boats are also associated with the spread of the exotic Eurasian watermilfoil (*Myriophyllum spicatum*), which is easily transported between water bodies when plant matter becomes entangled on boat propellers or trailers.

Establishing Special Recreation Management Areas (SRMAs) and Extensive Recreation Management Areas (ERMAs) would provide management emphasis for addressing recreation impacts to special status fish and aquatic invertebrate species habitats by geographic area. The miles of perennial stream and conservation and restoration reaches within each SRMA are provided in Table 4-143 and Table 4-144, respectively. The miles of riparian priority reaches in SRMAs are displayed in Table 4-145. Table 4-146 identifies special status species in each SRMA. The more miles of restoration reaches included in an SRMA, the greater the likelihood for HC ratings to be improved and the risk for impacts to special status fish and aquatic invertebrate species to be reduced.

Table 4-143. Perennial Streams in Special and Extensive Recreation Management Areas by Alternative (Miles)

SRMAs/ERMAs	Alternative					
	I	II	III	IV	V	VI
Balanced Rock	1	NA	1	NA	NA	1
Canyonlands	43	NA	NA	43	NA	NA
Canyonlands ERMA	NA	NA	NA	NA	NA	43
Deadman	NA	NA	NA	NA	NA	0
Deadman/Yahoo	1	NA	1	1	NA	NA
Jarbidge Foothills	61	NA	NA	NA	NA	NA
Jarbidge Foothills ERMA	NA	NA	NA	NA	NA	61
Jarbidge Forks	7	7	7	7	7	7
Little Pilgrim	2	2	2	NA	NA	2
Luds Point ERMA	NA	NA	NA	NA	NA	5
Rosevear ERMA	NA	NA	NA	NA	NA	0
Salmon Falls Reservoir	8	8	8	8	NA	3
Yahoo	NA	NA	NA	NA	1	1
Total	**123**	**17**	**19**	**59**	**8**	**SRMA=14 ERMA=109**

Note: NA indicates the SRMA or ERMA would not be designated in that alternative.
[A] The No Action Alternative did not identify boundaries for SRMAs.
[B] The Antelope Bay (1,300 acres) and Cedar Creek (100 acres) Recreation Management Zones do not contain perennial streams.

Table 4-144. Conservation and Restoration Reaches in Special and Extensive Recreation Management Areas by Alternative (Miles)

HC Rating [A]	Alternative [B]					
	I	II	III	IV	V	VI[C]
Canyonlands SRMA						
Conservation	7	NA	NA	7	NA	NA
Restoration	9	NA	NA	9	NA	NA
Total	**16**	**NA**	**NA**	**16**	**NA**	**NA**
Canyonlands ERMA						
Conservation	NA	NA	NA	NA	NA	7
Restoration	NA	NA	NA	NA	NA	9
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**16**

HC Rating [A]	Alternative [B]					
	I	II	III	IV	V	VI[C]
Jarbidge Foothills SRMA						
Conservation	5	NA	NA	NA	NA	NA
Restoration	21	NA	NA	NA	NA	NA
Total	**26**	**NA**	**NA**	**NA**	**NA**	**NA**
Jarbidge Foothills ERMA						
Conservation	NA	NA	NA	NA	NA	5
Restoration	NA	NA	NA	NA	NA	21
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**26**
Jarbidge Forks SRMA						
Conservation	6	6	6	6	6	6
Restoration	1	1	1	1	1	1
Total	**7**	**7**	**7**	**7**	**7**	**7**
Grand Total	**49**	**7**	**7**	**23**	**7**	**49**

Note: NA indicates the SRMA or ERMA would not be designated in that alternative.
[A] HC data are not available for the Balanced Rock, Deadman/Yahoo, Little Pilgrim, or Salmon Falls Reservoir SRMAs.
[B] The No Action Alternative did not identify boundaries for SRMAs.
[C] The Antelope Bay (1,300 acres) and Cedar Creek (100 acres) Recreation Management Zones do not contain perennial streams.

Table 4-145. Priority Reaches in Special and Extensive Recreation Management Areas by Alternative (Miles)

PFC Priority Rating	Alternative					
	I	II	III	IV	V	VI
Priority 1	46	7	7	19	6	85
Priority 2	24	0	0	5	0	48
Priority 3	42	2	3	16	1	81
Total	**112**	**9**	**10**	**40**	**7**	**214**

[A] The No Action Alternative did not identify boundaries for SRMAs.
[B] Alternative VI is the only alternative with ERMAs and the miles include reaches in both SRMAs and ERMAs.

Table 4-146. Occurrence of Special Status Fish and Aquatic Invertebrate Species and Expected Change in Use in Special and Extensive Recreation Management Areas

SRMA/ERMA	Change in Use	Special Status Fish and Aquatic Invertebrate Species				
		Bruneau Hot Springsnail	Bull Trout [A]	Redband Trout	Snake River Snails	White Sturgeon
Balanced Rock	Increase			X		
Canyonlands	No Change	X	X	X		
Canyonlands ERMA	No Change	X	X	X		
Deadman/Yahoo	No Change or Increase				X	X
Jarbidge Foothills	No Change			X		
Jarbidge Foothills ERMA	No Change			X		
Little Pilgrim	Increase				X	X
Salmon Falls Reservoir	Increase			X		

[A] Includes Designated Critical Habitat.

The following indicators were used to analyze the impacts of Recreation actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative provides limited direction for special status fish and aquatic invertebrate species and their habitats in the Bruneau-Jarbidge, Jarbidge Forks, and Salmon Falls Creek Canyon SRMAs. The Salmon Falls Creek Canyon SRMA has limited access due to the steep canyon walls and infrequent human use. The Bruneau-Jarbidge SRMA is a popular whitewater rafting area that, due to the flow regimes, has a short floating season. The short floating season and relatively low number of visitors would continue to maintain the condition of these rivers, although some localized impacts to water quality and riparian vegetation at campsites occur. The impacts would be relatively minor to designated critical habitat for bull trout and redband trout habitat in the Bruneau and Jarbidge Rivers. The Jarbidge Forks SRMA receives minimal recreation use, and recreation-related impacts to riparian and habitat condition in streams containing special status fish and aquatic invertebrate species would be localized in nature. The No Action Alternative includes limited direction for improving riparian and habitat condition in streams containing special status fish and aquatic invertebrate species specific to these SRMAs, but does provide direction for reducing recreational impacts to special status fish and aquatic invertebrate species under Endangered Species Act (ESA) consultations. This direction would maintain these habitats over the life of the plan.

Impacts from Management Common to All Action Alternatives

All action alternatives include management actions to protect riparian resources while enhancing recreation opportunities. Recreation activities would follow goals, objectives, and management actions for riparian areas and wetlands. This would reduce recreation-related impacts to riparian areas containing special status fish and aquatic invertebrate species, reduce impacts from existing recreation sites, and avoid the construction of new recreation sites in Riparian Conservation Areas (RCAs) unless a site-specific analysis determines the restoration direction in the Aquatic and Riparian Management Strategy (ARMS; Appendix D, Tables D-3, D-4, and D-5) can be achieved. This is expected to promote the attainment of Priority 1 and 2 reaches moving toward or achieving proper functioning condition (PFC) and HC restoration reaches moving toward conservation reaches over the life of the plan. ESA consultation would be required for recreation site development in RCAs containing bull trout and Snake River snails, which would reduce the risk for impacts to these species and their habitat.

Impacts from Management Specific to Alternative I

SRMAs in Alternative I would encompass 123 miles of perennial stream and 49 miles of conservation and restoration reaches. Alternative I, similar to Alternative VI, would have the most miles of conservation and restoration reaches and Priority 1 and 2 reaches in SRMAs of all action alternatives and would have the least risk for recreation-related impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species of all alternatives.

The Canyonlands and Jarbidge Forks SRMAs would include 50 miles of perennial stream and 42 miles of conservation and restoration reaches; including all of the occupied and 56% of the designated critical habitat for bull trout (except for a portion of lower Bruneau River) and approximately 20% of the redband trout habitat in the planning area. These areas would be managed for their remote recreation experience and undeveloped characteristics. Current use levels are expected to remain the same in these SRMAs. Localized impacts to PFC and HC ratings would likely remain static under this alternative. Monitoring recreation use would ensure that impacts to bull trout and redband trout habitat would not increase to levels that reduce PFC and HC ratings. The SRMA management and restoration direction in the ARMS would maintain or improve PFC and HC ratings for special status fish and aquatic invertebrate species over the life of the plan.

The Balanced Rock, Jarbidge Foothills, and Salmon Falls Reservoir SRMAs would include 70 miles of perennial stream and 26 miles of conservation and restoration reaches, including approximately 30% of

the redband trout habitat in the planning area. Recreation use is expected to increase in the Balanced Rock and Salmon Falls Creek SRMAs. Localized reductions to PFC and HC ratings may occur, but are likely to be limited as a result of increased management emphasis. In the Jarbidge Foothills SRMA, the potential for localized impacts to redband trout or their habitat is greater because redband trout exist in isolated populations. Increased management emphasis for recreation within these SRMAs, consistent with the restoration direction in the ARMS, would maintain or improve PFC and HC ratings for riparian areas containing special status fish and aquatic invertebrate species within these SRMAs.

The Little Pilgrim SRMA would provide management emphasis for recreation along the Snake River near the mouth of Little Pilgrim Gulch and include 2 miles of the Snake River occupied by white sturgeon and Snake River snails. This area is a popular area for white sturgeon fishing and receives moderate to heavy use throughout the summer months. Providing sanitation at the site and development of parking, camping, and improved vehicle access would reduce localized impacts to PFC ratings from human uses in the area. Recreation use is expected to increase in this SRMA. Impacts to riparian vegetation are expected to continue from recreators gathering firewood. Impacts to ESA-listed snails in the Snake River would locally be reduced from recreation-related improvements at this site.

The Deadman/Yahoo SRMA would provide management emphasis for Yahoo Creek. Yahoo Creek is a non-fish-bearing stream in a popular area for motorized off-highway vehicle recreation. This area contains highly erosive soils and is a source of sediment to the Snake River. Recreation use is expected to remain the same or increase in this SRMA. The increased management emphasis near Yahoo Creek would focus on allowing motorized recreation to continue on designated routes. Management for the SRMA would improve sanitation and parking for SRMA users. Recreation in the SRMA would continue to cause soil disturbance that would ultimately be introduced into the Snake River. Recreation-related impacts to special status fish and aquatic invertebrate species in the Snake River would be locally reduced under SRMA management.

Impacts from Management Specific to Alternative II

Alternative II would include the Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs and would include 17 miles of perennial stream. These SRMAs would encompass seven miles of conservation and restoration reach within the Jarbidge Forks SRMA. Alternative II would include 42 fewer miles of conservation and restoration reaches in SRMAs than Alternative I. It would have the same miles of conservation and restoration reaches in areas with SRMA management as Alternatives III and V, which is the least of all alternatives. SRMAs would include seven miles of Priority 1 and 2 reaches; the second fewest miles of all alternatives. The impacts from SRMA management on special status fish and aquatic invertebrate species for the Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs would be similar to those described for Alternative I. Alternative II would pose the second greatest risk for impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to recreation activities of all alternatives.

Impacts from Management Specific to Alternative III

Alternative III would include the Balanced Rock, Deadman/Yahoo, Little Pilgrim, Jarbidge Forks, and Salmon Falls Reservoir SRMAs. It would include 19 miles of perennial stream in SRMAs which is fewer miles than Alternatives I, IV, and VI, but more than Alternatives II and V. These SRMAs would encompass 7 miles of conservation and restoration reach; the same Alternatives II and V, which is less than Alternatives I, IV, and VI. The effects from management for the Balanced Rock, Deadman/Yahoo, Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs would be the same as described for Alternative I. SRMAs would include 7 miles of Priority 1 and 2 reaches. Alternative III would pose the third greatest risk for impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to recreation activities of all alternatives.

Impacts from Management Specific to Alternative IV

Alternative IV would include the Canyonlands, Deadman/Yahoo, Jarbidge Forks, and Salmon Falls Reservoir SRMAs. It would include 59 miles of perennial stream and 23 miles of conservation and restoration reaches. Alternative IV has fewer perennial stream miles and fewer miles of restoration reaches in SRMAs than Alternative I and VI but more miles than other alternatives. The impacts from

SRMA management for the Canyonlands, Deadman/Yahoo, Jarbidge Forks, and Salmon Falls Reservoir on special status fish and aquatic invertebrate species would be the same as Alternative I. Alternative IV would pose the second least risk for recreation-related impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species of all alternatives.

Impacts from Management Specific to Alternative V

Alternative V would include the Jarbidge Forks and Yahoo SRMAs and would have the fewest perennial stream miles in SRMAs of the alternatives. It would have the same amount of restoration reaches as Alternatives II and III, which is the least of all alternatives. Alternative V has the fewest miles of Priority 1 and 2 reaches in SRMAs of all alternatives. The effects from SRMA management for the Jarbidge Forks SRMA would be the same as Alternative I. The Yahoo SRMA would have the same impacts to special status fish and aquatic invertebrate species in the Snake River as the Deadman/Yahoo SRMA in Alternative I. Alternative V would have the fewest miles of special status fish and aquatic invertebrate species habitat within areas of SRMA management of all alternatives. Alternative V would pose the most risk for recreation-related impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species of all alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would include the Balanced Rock, Deadman, Jarbidge Forks, Little Pilgrim, Salmon Falls Reservoir, and Yahoo SRMAs. These six SRMAs would include 14 miles of perennial streams. Alternative VI would include more perennial stream miles in a SRMA than Alternative V but fewer miles than the other alternatives. The effects from SRMA management for the Balanced Rock, Yahoo, Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs on special status fish and aquatic invertebrate species would be the same as for Alternative I.

The four ERMAs would include 109 miles of perennial streams; these perennial miles are in addition to the 14 perennial miles within a SRMA. The ERMAs would be located in the Canyonlands, Jarbidge Foothills, Rosevear, and at Luds Point. The increased emphasis on recreation management would reduce impacts to PFC and HC ratings and improve conditions for special status fish and aquatic invertebrate species within these ERMAs.

The combined effect of six SRMAs and three ERMAs would be the most improvement in riparian areas containing special status fish and aquatic invertebrate species of all alternatives. Alternative VI, similar to Alternative I, would have the most miles of special status fish and aquatic invertebrate species habitat in areas with SRMA and ERMA management of all alternatives, and would have the least risk for recreation-related impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species of all alternatives.

Impacts from Transportation and Travel Actions

Transportation and travel systems can harm trout and their habitat because of the sediments they contribute to streams. Sediment generated by road construction, maintenance, and use can enter streams through surface erosion and mass movement of destabilized soil. Sediment in the stream can lead to physical alterations in channel morphology, such as increased channel braiding, increased width-to-depth ratios, and increased incidence and severity of streambank erosion. Excessive sediment delivery to streams can decrease the depth and number of pools, reducing the physical space available for rearing fish. These habitat changes can reduce habitat condition (HC) ratings and reduce survival and reproduction for all types of aquatic life (Furniss et al., 1991). Some road maintenance activities, such as improving road drainage and graveling road surfaces, can reduce the amount of fine sediments that enter a stream.

Improperly designed roads crossings can prevent or interfere with upstream and downstream migration of both adult and juvenile trout. Culverts pose the most common migration barriers associated with road networks, usually because of outfall drops that are too great, excessive water velocities through culverts, insufficient water depth in culverts, a lack of resting pools in or below the culvert, or a combination of these factors. In general, bridges are preferred because they usually cause less modification of the stream channel than culverts and are often the best way to assure fish passage (Furniss et al., 1991).

Cross-country motorized vehicle use increases the risk of impacts to riparian vegetation, sediment introduction to streams, and localized impacts to water quality. Over time, the number of cross-country travel routes in areas available for this use would be expected to increase in density and distance. This may result in an increase in human-related impacts in the Riparian Conservation Area (RCA). Travel restrictions in upland areas would have benefits to aquatic resources at the watershed scale if they result in less soil disturbance or surface erosion entering fish-bearing streams. Travel restrictions in RCAs would result in the most improvement in special status fish and aquatic invertebrate species habitats, particularly where proper functioning condition (PFC) and HC ratings indicate there are degraded channel and riparian conditions.

Table 4-147 identifies the miles of roads in RCAs by RCA category. Table 4-148 identifies the perennial stream miles in each travel designation by alternative. Table 4-149 identifies the miles of conservation, restoration, and priority reaches by travel designation for each alternative.

Table 4-147. Roads in Riparian Conservation Areas

RCA Category	Miles of Roads
Category 1: Perennial Fish-Bearing Streams	32
Category 2: Perennial Non Fish-Bearing Streams	5
Category 3: Ponds, Lakes, Reservoirs, and Wetlands > 1 acre	4
Category 4: Intermittent Streams, Wetlands < 1 acre, and Landslide Prone Areas	175
Total	**216**

Table 4-148. Perennial Streams within Travel Designations by Alternative (Miles)

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Open to Cross-Country Motorized Vehicle Use	68	< 1	0	< 1	< 1	< 1	< 1
Limited to Designated Routes [A]	88	109	128	117	110	101	117
Limited to Designated Routes [B]	47	71	85	85	85	71	85
Closed to Motorized Vehicle Use	31	54	20	31	39	62	31
Closed to Motorized and Mechanized Travel - Wilderness	84	84	84	84	84	84	84

[A] Limited seasonally or to designated routes.
[B] All motorized and mechanized off-highway vehicles per the Omnibus Public Lands Management Act of 2009.

Table 4-149. Habitat Condition and Priority Reaches within Travel Designations by Alternative (Miles)

HC Rating	Alternative						
	No Action	I	II	III	IV	V	VI
HC Reaches							
Open to Cross-Country Motorized Vehicle Use							
Conservation	6	0	0	0	0	0	0
Restoration	12	0	0	0	0	0	0
Limited to Designated Routes							
Conservation	12	17	18	18	15	14	18
Restoration	19	25	31	31	29	23	31
Closed to Motorized and Mechanized Travel							
Conservation	< 1	1	0	0	3	4	0
Restoration	2	9	3	3	6	11	3

HC Rating	Alternative						
	No Action	I	II	III	IV	V	VI
Priority Reaches							
Open to Cross-Country Motorized Vehicle Use							
Priority 1	17	0	0	0	0	0	0
Priority 2	18	0	0	0	0	0	0
Priority 3	23	< 1	0	< 1	< 1	< 1	< 1
Limited to Designated Routes							
Priority 1	44	59	61	61	57	55	61
Priority 2	45	61	63	63	60	59	63
Priority 3	34	48	57	57	54	44	57
Closed to Motorized and Mechanized Travel							
Priority 1	15	16	15	15	20	21	15
Priority 2	0	2	0	0	2	4	0
Priority 3	28	38	28	28	31	41	28

The following indicators were used to analyze the impacts of Transportation and Travel actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 68 miles of perennial stream are included in areas open to cross-country motorized vehicle use, 135 miles of stream are in areas limited seasonally or to designated routes, and 115 miles of stream are in areas closed to motorized travel. Areas closed to motorized vehicle use include the Bruneau and Jarbidge Canyons and portions of the Salmon Falls Creek Canyon. There are 216 miles of roads in RCAs. These roads will continue to locally reduce PFC and HC ratings by contributing fine sediment to fish-bearing streams, removing riparian vegetation, and impacting riparian and habitat condition due to increased motorized use in the RCA.

Route density would continue to increase due to a substantial increase in use of off-highway vehicles and off-road motorcycles, which enables public land users to pioneer roads into areas previously not accessible. The overall impacts from roads and their use on special status fish and aquatic invertebrate species are an increase in the number of stream fords, increased sediment contributions to fish-bearing streams, increased recreational use in RCAs, an increase in noxious weeds in riparian areas, and an increased incidence of human-caused fires. All of these have contributed to a reduction in PFC and HC ratings in the planning area. The No Action Alternative does not include direction for reducing road impacts on special status fish and aquatic invertebrate species and their habitats.

Impacts from Management Common to All Action Alternatives

Transportation and travel management would reduce impacts from existing roads and avoid construction of new roads in RCAs unless a site-specific analysis indicates long-term adverse effects to special status fish and aquatic invertebrate species and RCAs can be avoided. Endangered Species Act (ESA) consultation with the US Fish and Wildlife Service would be required for road construction, reconstruction, or reclamation in RCAs containing bull trout or their designated critical habitat, Snake River snails, or Bruneau hot springsnail. Compliance with ESA consultation would reduce the potential for adverse effects to special status fish and aquatic invertebrate species and their habitats. The Aquatic and Riparian Management Strategy (ARMS) direction would also reduce effects to aquatic sensitive species habitats.

Developing a Travel Management Plan would provide a site-specific analysis to identify road closures, travel restrictions, or other travel management adjustments to reduce impacts on RCAs and special status fish and aquatic invertebrate species. Short-term localized reductions with long-term improvements in PFC and HC ratings in special status species habitats would occur as a result of road improvement projects, culvert replacements, route closures, or road rehabilitation. Implementing actions that result in

short-term effects for long-term improvements in PFC and HC ratings complies with direction in the ARMS. The potential for impacts to special status fish and aquatic invertebrate species or their habitats from roads in the RCA would continue to occur until mitigation is applied or restoration actions are accomplished to reduce road-related impacts.

Impacts from Management Specific to Alternative I

In Alternative I, the 3,600 acres of the Deadman/Yahoo Special Recreation Management Area (SRMA) would be open to cross-country motorized vehicle use. This area would encompass less than one mile of perennial stream, which is a Priority 3 reach. HC data was not available for the SRMA. The effects of cross-country travel on PFC ratings across large portions of the planning area would be reduced to less than one mile within the SRMA. Management direction for the SRMA would maintain the PFC rating within the SRMA. Even though motorized cross-country travel would not be authorized along perennial or intermittent streams throughout the planning area as in the No Action Alternative, in this alternative exceptions may be granted to BLM permit, lease, or right-of-way (ROW) holders or may be allowed on a case-by-case basis for non-BLM government entities. Cross-country motorized vehicle use in RCAs or wetlands would locally reduce PFC ratings. Similar impacts are expected from allowing game retrieval using motorized vehicles 300 feet off designated routes except in closed areas and the Salmon Falls Creek Wilderness Study Area. Motorized cross-country travel 25 feet off designated routes to access a campsite is less likely to affect PFC ratings as it would not be allowed in riparian areas.

Areas closed to motorized and mechanized vehicle use in Alternative I would encompass 138 miles of perennial stream and 10 miles of conservation and restoration reaches. The closed areas are located in the Bruneau and Jarbidge Canyons, portions of the Jarbidge River, and in the Salmon Falls Creek Canyon. Road-related impacts may still occur in closed areas if roads in closed areas are not reclaimed, although the impacts would be less than if the road was still in use. Alternative I would have more miles of perennial stream and more miles of conservation and restoration reaches in areas closed to motorized and mechanized use than the No Action Alternative.

Limiting travel to designated routes or the use of seasonal restrictions or other motorized and mechanized restrictions would reduce travel-related impacts on 180 miles of perennial streams; of these miles, 17 miles are conservation and 25 miles are restoration reaches. Motorized use on designated routes poses less risk to watershed resources since use is occurring on an already-disturbed surface. Erosion and physical disturbance to stream channels can be addressed through design criteria, maintenance, location, and seasonal restrictions. Travel limitations would reduce the potential for a decrease in PFC and HC ratings in habitats occupied by special status species. Alternative I has more miles of conservation and restoration reaches in areas with limited travel designations than the No Action Alternative.

Alternative I would create five Travel Management Areas (TMAs); route designation within the TMAs is expected to reduce road-related impacts to RCAs containing special status fish and aquatic invertebrate species over the long term. Route density would be expected to increase on 41,000 acres (3%) of the planning area, remain the same on 667,000 acres (49%), and decrease on 664,000 acres (48%). Any changes in route density would affect PFC and HC ratings for RCAs containing special status fish and aquatic invertebrate species. Areas where route density increases would have impacts to RCAs in addition to those which have already occurred. In Alternative I, portions of the Deadman and Yahoo areas would be open to cross-country motorized vehicle use and would encompass less than one mile of perennial stream. These stream miles do not contain special status fish and aquatic invertebrate species, but Yahoo Creek can be a source of sediment to the Snake River, which is occupied by special status fish and aquatic invertebrate species. Designating routes within the Yahoo TMA, combined with the designation of this area as a SRMA, would reduce the potential for cross-country motorized vehicle use to impact special status fish and aquatic invertebrate species habitats in the Snake River.

There is a larger decrease in route density expected under this alternative than Alternatives II, III, and VI but less of a decrease than expected under Alternatives IV and V. In general, any decrease in route density in riparian areas would reduce impacts to special status fish and aquatic invertebrate species and their habitat.

Impacts from Management Specific to Alternative II

The impacts from cross-country motorized vehicle use on PFC ratings would no longer occur because none of the planning area would be open to cross-country motorized vehicle use; however, localized impacts to PFC ratings may occur as Alternative II would not restrict game retrieval off designated routes and would allow motorized cross-country travel 100 feet off designated routes to access a camp site. Authorizing cross-country motorized vehicle use for game retrieval, to access recreation sites or for administrative purposes would have the same localized impacts to PFC and HC ratings as described for Alternative I.

Areas closed to motorized and mechanized vehicle use in Alternative II would encompass 104 miles of perennial stream which include 3 miles of restoration reaches, both of which are the fewest miles of all alternatives. Areas designated as closed to motorized and mechanized vehicle use would reduce impacts to occupied redband trout and designated critical habitat for bull trout. Portions of redband trout habitat in Salmon Falls Creek Canyon would also be closed to motorized vehicle use. Road-related impacts may still occur in closed areas if roads in closed areas are not reclaimed, although the impacts would be less than if the road was still in use. Alternative II would have the same impacts to HC ratings as Alternative I, except fewer miles of perennial stream and restoration reaches would be closed to motorized and mechanized use.

Limiting travel to designated routes or the use of seasonal restrictions or other motorized and mechanized restrictions would reduce travel-related impacts on 213 miles of perennial streams which is the most of all alternatives. Of these miles, 18 miles are conservation and 31 miles are restoration reaches. The Jarbidge River, it's East Fork, and the tributaries important for bull trout (i.e. designated critical) and redband trout would be included in areas limited to designated routes or have seasonal use restrictions. These bull trout and redband trout habitats would be at risk for a reduction in PFC and HC ratings due to travel in the RCA. The redband trout streams in the Jarbidge Foothills would be in areas limited to designated routes or have seasonal use restrictions and would be at risk for reduction in PFC and HC ratings due to travel, but at less risk than if these areas were open to cross-country motorized vehicle use. The impacts to HC ratings for Alternative II would be the same as for Alternative I except more miles of perennial stream would be in areas with limited travel designations.

Alternative II would create two TMAs. Route density would be expected to increase on 1,159,000 acres (85%) and would remain the same on 213,000 acres (15%) of the TMAs. This is a substantially larger area where route density is expected to increase than in any of the action alternatives. In general, any increase in route density in riparian areas would increase impacts to special status fish and aquatic invertebrate species and their habitat.

Impacts from Management Specific to Alternative III

The impacts from cross-country motorized vehicle use on PFC ratings are the same as described for Alternative I; however, the area impacted may decrease as Alternative III would not allow game retrieval off designated routes.

Areas closed to motorized and mechanized vehicle use in Alternative III would encompass 115 miles of perennial stream which include 3 miles of restoration reaches. The miles of perennial stream in areas closed to motorized and mechanized would be the same as for the No Action Alternative. Areas designated as closed to motorized and mechanized vehicle use would reduce impacts to occupied redband trout and designated critical habitat for bull trout. Road-related impacts may still occur in closed areas if roads in closed areas are not reclaimed, although the impacts would be less than if the road was still in use. Alternative III would have the same effects to PFC and HC ratings in areas occupied by special status fish and aquatic invertebrate species as described for Alternative II; however, more perennial stream miles would be in areas closed to motorized vehicle use in Alternative III.

Limiting travel to designated routes or the use of seasonal restrictions or other motorized and mechanized restrictions would reduce travel-related impacts on 202 miles of perennial streams which is the second most of all alternatives. Similar to Alternative II, 18 miles are conservation and 31 miles are restoration

reaches. The impacts would be the same as for Alternative II, except fewer miles of perennial stream would be in areas with limited travel designations.

Alternative III would create five TMAs. Route density would be expected to increase on 34,000 acres (2%) in the planning area and remain the same on 1,337,000 acres (98%). There would be no reduction in route density because routes would be maintained for wildland fire suppression efforts. The result would be a slower rate of recovery of PFC and HC ratings from road-related impacts to special status aquatic habitats than would occur under any of the other action alternatives, but a faster rate than in the No Action Alternative.

Impacts from Management Specific to Alternative IV

The impacts from cross-country motorized vehicle use on PFC ratings are the same as described for Alternative I; however, the area impacted may decrease as Alternative IV would not allow game retrieval off designated routes.

Areas closed to motorized and mechanized vehicle use in Alternative IV would encompass 123 miles of perennial stream which include 11 miles of conservation and 17 miles of restoration reaches. The location of the closed areas would be the same as Alternative I with the exception of additional closures in the China Creek area and in the upper reaches of Salmon Falls Creek. The impacts to HC ratings in areas closed to motorized and mechanized vehicle use would be similar to those describe for Alternative I. Alternative IV would have fewer perennial stream miles closed to motorized and mechanized vehicle use than Alternatives I and V but more than the No Action Alternative and Alternatives II, III, and VI.

Limiting travel to designated routes or the use of seasonal restrictions or other motorized and mechanized restrictions would reduce travel-related impacts on 195 miles of perennial streams. Of these miles, 15 miles are conservation and 29 miles are restoration reaches. The impacts to HC ratings in bull trout (i.e. designated critical) and redband trout habitat would be the same as for Alternative I, except more perennial stream miles would be in areas with limited designations. Alternative IV has fewer perennial stream miles in travel limited designation than Alternatives II, III, and VI but more than Alternatives I, V, and the No Action Alternative. Alternative IV would have fewer miles of conservation and restoration reaches in areas with limited travel designations than Alternatives II and III but more than Alternatives I, V, and VI and the No Action Alternative.

Alternative IV would create the same TMAs described under Alternative I. Route density under Alternative IV would be expected to increase on 34,000 acres (2%) in the planning area and decrease on 1,337,000 acres (98%). A portion of the changes in route density are likely to occur in riparian areas containing special status fish and aquatic invertebrate species. A reduction in route density would improve PFC and HC ratings over the life of the plan. This alternative is expected to result in the second greatest reduction in route density of all alternatives; slightly less than Alternative V but more than the other alternatives.

This alternative emphasizes active restoration and increases the likelihood that more miles of road in the RCA would be modified to reduce impacts to PFC and HC ratings than in Alternatives I, II, and III. There would be short-term localized reductions in PFC and HC ratings from road improvement, relocation, or restoration activities, but these activities are expected to improve these ratings in the long term. This alternative, similar to Alternative VI would have the most short-term impacts and the fastest recovery of riparian and habitat conditions of any of the action alternatives.

Impacts from Management Specific to Alternative V

Alternative V would have the least impacts from cross-country motorized vehicle use on PFC ratings compared to any other alternative, as no exceptions to motorized vehicle restrictions would be granted to permit, lease, and ROW holders or for game retrieval. Access to recreation sites would be limited to 25 feet of designated routes and would not be allowed in RCAs; the impacts to PFC ratings would be the same as Alternative I. The only area open to cross-country motorized vehicle use would be in the 700 acre Yahoo SRMA, which encompass less than one mile of Priority 3 reach. Management direction for the SRMA would maintain the PFC rating within the SRMA.

Areas closed to motorized and mechanized vehicle use in Alternative V would encompass 146 miles of perennial stream which include 14 miles of conservation and 11 miles of restoration reaches, both of which are the most miles of all alternatives. The location of the closed areas would include portions of the China Creek area and the upper reaches of Salmon Falls Creek, which would reduce the potential for travel-related impacts to an additional 10 miles of redband trout habitat. Areas designated as closed to motorized and mechanized vehicle use would reduce impacts to occupied redband trout and designated critical habitat for bull trout as described for Alternative I except impacts would be reduced over more miles of perennial stream.

Limiting travel to designated routes or the use of seasonal restrictions or other motorized and mechanized restrictions would reduce travel-related impacts on 172 miles of perennial streams. Of these miles, 14 miles are conservation and 22 miles are restoration reaches. The impacts of travel designations would be the same described for Alternative I.

Alternative V would create five TMAs. Route density would be expected to decrease on 1,370,000 acres (99%). This is likely to have a major long-term beneficial effect on special status species habitats as a primary source of sediment to streams channels is reduced. There would be short-term adverse effects from road improvements, relocations, or restoration activities, but the long-term beneficial effects from these activities are expected to out-weigh the short-term adverse effects. The expected route density decrease would have the greatest benefit to perennial streams and PFC and HC ratings of all alternatives.

This alternative is expected to implement more road restoration activities in RCAs than any of the other action alternatives. These restoration activities would likely cause localized adverse effects to fish-bearing streams during the restoration activities, but overall effects to RCAs containing special status fish and aquatic invertebrate species would be reduced. Alternative V would likely have fewer short-term adverse effects than under Alternative IV because more passive techniques would be used for restoration. The passive restoration techniques would result in some areas not being fully restored because more aggressive techniques may be necessary. The rate of recovery of some of the riparian areas with road closures would be slower than if active restoration was used to expedite the recovery process. However, this alternative would result in a significant reduction in route density over the life of the plan, which would be expected to have a major reduction in road-related impacts to special status fish and aquatic invertebrate species habitats.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The impacts from cross-country motorized vehicle use on PFC ratings are the same as described for Alternative I; however, the area impacted may decrease as Alternative VI would not allow game retrieval off designated routes. The impacts to PFC ratings from motorized cross-country travel to access a camp site would be the same as Alternative II, except seasonal use restrictions would be applied if dispersed camping results in localized reductions in PFC ratings.

Areas closed to motorized and mechanized vehicle use in Alternative VI would encompass 115 miles of perennial stream and 3 miles of restoration reaches. The impacts to restoration reaches from motorized and mechanized closures would be the same as described for Alternative I but the miles of perennial stream and HC reaches would be the same as for Alternative III and the No Action Alternative.

Limiting travel to designated routes or the use of seasonal restrictions or other motorized and mechanized restrictions would reduce travel-related impacts on 202 miles of perennial streams which is the same as Alternative III. Similar to Alternatives II and III, 18 miles are conservation and 31 miles are restoration reaches. The impacts would be the same as described for Alternative I except the number of miles of perennial stream and HC reaches impacted would be the same as Alternative III.

Alternative VI would create five TMAs. Route density under Alternative VI would be expected to increase on 34,000 acres (2%) in the planning area, decrease on 135,000 acres (10%), and remain the same for 1,202,000 acres (88%). A portion of the changes in route density are likely to occur in riparian areas containing special status fish and aquatic invertebrate species. A reduction in route density would improve PFC and HC ratings over the life of the plan.

Alternative VI emphasizes active restoration and increases the likelihood that more miles of road in the RCA would be modified to reduce impacts to PFC and HC ratings than in Alternatives I, II, and III. There would be short-term localized reductions in PFC and HC ratings from road improvement, relocation, or restoration activities, but these activities are expected to improve these ratings in the long term. This alternative, similar to Alternative IV would have the most short-term impacts and the fastest recovery of riparian and habitat conditions of any of the action alternatives.

Impacts from Land Use Authorizations Actions

The impacts from land use authorizations on special status fish and aquatic invertebrate species vary by the type of authorization, its location, season and duration of use, and proximity of use to streams containing special status species or their habitats. Some uses, such as upland powerlines, phone lines, and telecommunication sites, would have little or no potential to reduce proper functioning condition (PFC) and habitat condition (HC) ratings. Other land use authorizations, such as roads, water developments, ditches, energy projects, and other surface-disturbing uses, have the potential to reduce PFC and HC ratings depending on their proximity to streams containing special status species. The impacts from these uses include increased sediment, reduced instream flows, and the removal of riparian vegetation, all of which reduce PFC and HC ratings.

Utility right-of-way (ROW) corridors can contain powerlines, support towers, roads, and other operational and maintenance structures. The primary effect of utility ROW corridors on aquatic habitats occurs where roads enter the Riparian Conservation Area (RCA). The impacts of roads on riparian areas and the sediment they introduce into fish-bearing habitats are described under *Impacts from Transportation and Travel Actions*. The construction of utility developments can impact water quality from the storage and use of hazardous chemicals (e.g., petroleum products, lubricants, drill fluids, and others; see *Impacts from Water Resources Actions*). Surface waters may be needed to facilitate road construction or reconstruction, for dust abatement on roads or equipment staging areas, or for mixing with concrete to construct tower foundations. All new utility developments would comply with the Aquatic and Riparian Management Strategy (ARMS) to reduce impacts to special status species.

Wind energy projects are an increasing use on public lands, and the number of wind energy projects is expected to increase over the life of the plan. Most of the infrastructure for wind energy projects, such as towers, support facilities, and associated powerlines, are located in upland areas or ridge tops and would have limited impacts to RCAs or fish-bearing habitat. The road systems that support wind energy projects pose the greatest threat to aquatic resources from the use of existing roads and creation of new roads. Any locations where roads enter RCAs would have impacts to stream channel conditions and riparian vegetation. Where roads cross fish-bearing streams, the use of culverts or bridges directly influences the long-term impacts to HC ratings. Wind energy projects can also have short-term impacts to instream flows if surface water is required for road construction or reconstruction, dust abatement on roads or equipment staging areas, or mixing with concrete to construct tower foundations. The impacts from removing surface water from fish-bearing streams vary by location, amount and rate of withdrawal, and season.

Table 4-150 identifies the perennial stream miles in ROW exclusion or avoidance areas, areas available for ROWs, utility ROW corridors, and expected wind energy development areas. Table 4-151 displays conservation and restoration reaches in ROW exclusion or avoidance areas, areas available for ROWs, utility ROW corridors, and expected wind energy development areas. The miles of riparian priority reaches in ROW avoidance or exclusion areas, and areas available for ROWs are displayed in Table 4-152.

Table 4-150. Perennial Streams in Right-of-Way Exclusion or Avoidance Areas or in Right-of-Way Corridors for Utilities and Expected Wind Energy Development Areas by Alternative (Miles)

	Alternative						
	No Action	I	II	III	IV	V	VI
ROW Exclusion Areas	104	107	104	107	125	148	107
ROW Avoidance Areas [A]	248	248	248	248	248	295	297
ROW Available Areas	69	69	69	69	60	22	21
Utility ROW Corridors	2	9	9	9	9	9	6
Expected Wind Energy Development Areas	27	4	40	8	4	4	9

[A] Identified as utility avoidance areas in the No Action Alternative.

Table 4-151. Conservation and Restoration Reaches in Right-of-Way Exclusion or Avoidance Areas or in Expected Wind Energy Development Areas by Alternative (Miles)

HC Rating	Alternative						
	No Action	I	II	III	IV	V	VI
ROW Exclusion Areas							
Conservation	0	0	0	0	3	4	0
Restoration	3	3	3	3	5	12	3
Total	**3**	**3**	**3**	**3**	**8**	**16**	**3**
ROW Avoidance Areas							
Conservation	13	13	13	13	13	18	18
Restoration	24	24	24	24	24	35	35
Total	**37**	**37**	**37**	**37**	**37**	**53**	**53**
ROW Available Areas							
Conservation	5	5	5	5	2	0	0
Restoration	11	11	11	11	9	0	0
Total	**16**	**16**	**16**	**16**	**11**	**0**	**0**
ROW Utility Corridors							
Conservation	0	1	1	1	1	1	0
Restoration	0	3	3	3	3	3	0
Total	**0**	**4**	**4**	**4**	**4**	**4**	**0**
Expected Wind Energy Development Areas							
Conservation	5	0	5	0	0	0	0
Restoration	5	0	8	< 1	0	0	0
Total	**10**	**0**	**13**	**< 1**	**0**	**0**	**0**

[A] Streams with HC data for Alternatives I, IV, V, and VI are in areas unavailable for wind energy development.

Table 4-152. Priority Reaches in Right-of-Way Avoidance Areas, Exclusion Areas, and Areas Available for Rights-of-Way by Alternative (Miles)

Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
ROW Avoidance Areas [A]							
Priority 1	58	58	58	58	58	75	75
Priority 2	50	50	50	50	50	56	56
Priority 3	67	67	67	67	67	82	82
Total	**175**	**175**	**175**	**175**	**175**	**213**	**213**
ROW Exclusion Areas							
Priority 1	15	15	15	15	19	21	15
Priority 2	0	0	0	0	2	4	0
Priority 3	28	30	28	30	33	43	30
Total	**43**	**45**	**43**	**45**	**55**	**68**	**45**

Priority Rating	Alternative						
	No Action	I	II	III	IV	V	VI
ROW Available Areas							
Priority 1	18	18	18	18	13	1	1
Priority 2	13	13	13	13	10	7	6
Priority 3	17	17	17	17	14	3	3
Total	**48**	**48**	**48**	**48**	**37**	**11**	**10**

[A] Identified as utility avoidance areas in the No Action Alternative.

The following indicators were used to analyze the impacts of Land Use Authorizations actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

ROW exclusion areas would encompass 104 miles of perennial streams in the Sand Point Area of Critical Environmental Concern (ACEC) and Bruneau-Jarbidge Rivers Wilderness. Impacts to riparian areas from land use authorizations are not expected to occur within ROW exclusion areas because ROW would not be granted. The No Action Alternative would protect three miles of restoration reaches in ROW exclusion areas which is the same number of miles as Alternatives I, II, III, and VI. ROW exclusion areas would also protect 43 miles of streams with PFC ratings, with is the same number of miles as Alternative II; however, this is fewer miles protected than other alternatives. ROW avoidance areas would encompass 248 miles of perennial streams. Within ROW avoidance areas, there are 24 miles of restoration and 13 miles of conservation reaches; the same as for Alternatives I, II, III, and IV. PFC ratings were completed on 175 miles of these streams; 108 miles are Priority 1 and 2 reaches. The ROW avoidance areas include the redband trout habitat in the Bruneau River, Jarbidge River below the confluence with the East Fork, and a portion of the redband trout habitat in the Jarbidge River and its East Fork. The designated critical habitat for bull trout in the lower portion of the Jarbidge River would be a ROW avoidance area, as would a portion of the Bruneau hot springsnail habitat in the lower Bruneau River. Redband trout habitats in the Salmon Falls Creek Canyon would also be in a ROW avoidance area. Other than in the Sand Point ACEC, none of the areas adjacent to the Snake River would be excluded from utility development. The No Action Alternative would have the same miles of Priority 1 and 2 reaches in ROW avoidance areas as Alternatives I, II, III, and IV; the impacts to riparian areas containing special status fish and aquatic invertebrate species are the same for these alternatives. Areas available for ROWs would encompass 69 miles of perennial streams. HC ratings were completed on 16 of these miles; 11 miles are restoration reaches and would be at risk for impacts due to ROW authorizations. PFC ratings were completed on 48 of these miles; 31 miles are Priority 1 and 2 reaches and would be at risk for impacts to riparian condition due to ROW authorizations. The No Action Alternative would have the most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species; same as Alternative II, slightly more than Alternatives I and III, and more than Alternatives IV, V, and VI.

Utility ROW corridors would encompass 2 miles of perennial streams. None of the streams have are in areas with HC ratings, and less than 1 mile is in Priority 1 and 2 reaches. The No Action Alternative would have the fewest miles of perennial streams and Priority 1 and 2 reaches within utility ROW corridors and would pose the fewest risk for impacts to special status fish and aquatic invertebrate species and their habitat due to utility ROW development of all alternatives.

Expected wind energy development areas would encompass 27 miles of perennial stream. There are 10 miles of conservation and restoration reaches in areas with expected wind energy development; less than Alternative II but more than the other alternatives. There are 25 miles of PFC rated reaches in expected wind energy development areas. This alternative has fewer miles of restoration reaches in expected wind energy development areas than Alternative II but more miles than the other alternatives. The No Action Alternative ranks second in risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to expected wind energy development areas.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The No Action Alternative and all action alternatives would adopt the programmatic policies and best management practices for the wind energy development program (Appendix B). The adoption of this direction and guidance would reduce the potential for wind energy projects to impact special status fish and aquatic invertebrate species or their habitat.

Impacts from Management Common to All Action Alternatives

New ROWs on public land would comply with the goals and objectives for water resources, riparian areas and wetlands, fish, and special status species to improve riparian and habitat condition in ROW avoidance areas, areas available for ROWs, utility ROW corridors, and in expected wind energy development areas. The management actions would be consistent with the restoration priorities displayed in the ARMS (Appendix D, Tables D-3, D-4, and D-5). This management would reduce the risk for impacts to special status fish and aquatic invertebrate species habitat due to land use authorizations on BLM-managed land.

Impacts from Management Specific to Alternative I

ROW exclusion areas would encompass 107 miles of perennial stream and 3 miles of restoration reaches. This alternative has the same miles of restoration reaches within ROW exclusion areas as the No Action Alternative and Alternatives II, III, and VI. PFC ratings were completed on 45 miles of these streams; the same as for Alternatives III and VI. The ROW exclusion areas contain designated critical habitat for bull trout in the Jarbidge River and portions of the Bruneau River, redband trout habitat in a portion of Salmon Falls Creek, and a small section of the Snake River snail and white sturgeon habitat along the Sand Point ACEC. Since these areas would not be available for ROWs, impacts to special status fish and aquatic invertebrate species are not expected. Alternative I, similar to Alternatives III and VI, would have the second fewest miles of riparian area containing special status fish and aquatic invertebrate species habitat in ROW exclusion areas; more than the No Action Alternative and Alternative II but less than Alternatives IV and V. ROW avoidance areas would encompass the same miles of perennial streams and the same miles of restoration reaches as the No Action Alternative and Alternatives II, III, and IV. ROW avoidance areas would include all of the designated critical habitat for bull trout within the planning area except for a portion of the Bruneau River below the Lower Bruneau River ACEC; Wild and Scenic River segments which include the free-flowing section of the Snake River occupied by white sturgeon and Snake River snails and redband trout habitats in upper Salmon Falls Creek, Salmon Falls Creek Canyon, portions of Rocky Canyon Creek, Jarbidge River and its forks, Bruneau River, and lower Clover Creek. The risk for impacts to special status fish and aquatic invertebrate species for ROW avoidance areas are greater than for Alternatives V and VI and the same as for the other alternatives. Areas available for ROWs would include the same miles of perennial stream, restoration reaches, and priority reaches as the No Action Alternative and Alternatives II and III. Alternative I would pose the second most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to expected wind energy development areas; same as Alternative III, slightly less than the No Action Alternative and Alternative II, but more than Alternatives IV, V, and VI.

Utility ROW corridors would include nine miles of perennial stream. There are four miles of HC rated reaches within these corridors, three miles are restoration reaches. There are eight miles of PFC rated reaches within these corridors; three miles are Priority 1 and 2 reaches. A majority of the utility ROW corridors are in upland areas and would have limited impacts, if any, to RCAs containing special status fish and aquatic invertebrate species. The greatest risk for impacts would occur where utilities are buried in the RCA or where new stream crossings are created to support utility corridors. The utility ROW corridors for Alternative I and their risk for impacts to special status fish and aquatic invertebrate species are the same as for Alternatives II, III, IV, and V, which is more than the No Action Alternative and Alternative VI. The risk for impacts to special status fish and aquatic invertebrate species and their habitat are the same for all four alternatives.

Alternative I has no miles of HC rated stream in expected wind energy development areas, same as Alternatives IV, V, and VI, which is the least of all alternatives. It has no miles of PFC rated stream expected wind energy development areas, the least of all alternatives. Alternative I would pose the least

risk for impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species due to wind energy development.

Impacts from Management Specific to Alternative II

ROW exclusion areas would include the same miles of perennial streams, HC rated streams, and PFC rated streams as the No Action Alternative. The result of the ROW exclusion area designations would be the same as for the No Action Alternative; fewer miles of special status fish and aquatic invertebrate species habitat would be in ROW exclusion areas than for other alternatives. ROW avoidance areas would include the same miles of perennial stream and the same miles of restoration reaches as the No Action Alternative and Alternatives I, III, and IV. The risk of impacts to special status fish and aquatic invertebrate species and their habitat are the same as for the other alternatives; more than for Alternatives V and VI. Areas available for ROWs would include the same miles of perennial stream, restoration reaches, and priority reaches as the No Action Alternative and Alternatives I and III. Alternative II would have the most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species; same as the No Action Alternative, slightly more than Alternatives I and III, and more than Alternatives IV, V, and VI.

Utility ROW corridors would be in the same areas as described in Alternative I. The impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species would be the same as Alternative I.

Expected wind energy development areas would occur in the same general areas as described in Alternative I, but would also include a portion of Jarbidge Foothills and upper Bruneau River near the Nevada state line. These expected wind energy development areas include 40 miles of perennial stream which is the most miles of all alternatives. There are 8 miles of restoration reaches in the expected wind energy development areas and 37 miles of PFC rated reaches. Alternative II would pose the most risk for impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species due to wind energy development.

Impacts from Management Specific to Alternative III

ROW exclusion areas would encompass the same miles of perennial streams, restoration reaches, and PFC rated streams as Alternatives I and VI. The result of the ROW exclusion area designations would be the same for all three alternatives; more miles of special status fish and aquatic invertebrate species habitat would be in ROW exclusion areas than the No Action Alternative and Alternative II but less than would be within ROW exclusion areas for Alternatives IV and V. ROW avoidance areas would include the same miles of perennial stream and the same miles of restoration reaches as the No Action Alternative and Alternatives I, II, and IV. The risk for impacts to special status fish and aquatic invertebrate species and their habitat are the same for these alternatives; which is more than for Alternatives V and VI. Areas available for ROWs would include the same miles of perennial stream, restoration reaches, and priority reaches as the No Action Alternative and Alternatives I and II.

Utility ROW corridors would be in the same areas as described in Alternative I. The impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species would be the same as Alternative I.

Expected wind energy development areas for Alternative III would include eight miles of perennial streams and less than one mile of restoration reach. These areas encompass five miles of PFC rated reaches. Alternative III would have more miles of Priority 1 and 2 reaches in expected wind energy development areas than Alternatives I, IV, and V but less than the other alternatives. Alternative III would pose the third least risk for impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species due to wind energy development.

Impacts from Management Specific to Alternative IV

ROW exclusion areas would include 125 miles of perennial stream and 5 miles of restoration reaches. ROW exclusion areas are the same as those described for Alternative I with the addition of Lands with Wilderness Characteristics. PFC ratings were completed on 55 miles of these streams. Alternative IV

would have less miles of special status fish and aquatic invertebrate species habitat within ROW exclusion areas than Alternative V but more than the other alternatives. It would rank second in the miles of special status species habitat in ROW exclusion areas. ROW avoidance areas would include the same miles of perennial stream and the same miles of restoration reaches as the No Action Alternative and Alternatives I, II, and III. The risk for impacts to special status fish and aquatic invertebrate species and their habitat are the same for these alternatives; which is more than for Alternatives V and VI. Areas available for ROWs would encompass 60 miles of perennial streams. HC ratings were completed on 11 of these miles; 9 miles are restoration reaches and would be at risk for impacts due to ROW authorizations. PFC ratings were completed on 37 of these miles; 23 miles are Priority 1 and 2 reaches and would be at risk for impacts to riparian condition due to ROW authorizations. Alternative IV would pose the third least risk for impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species; less than Alternatives V and VI, but more than the other alternatives.

Utility ROW corridors would be in the same areas as described in Alternative I. The impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species would be the same as Alternative I.

Expected wind energy development areas for Alternative IV would impact the same perennial streams as Alternatives I and V, which is the least of all alternatives. None of these miles include conservation or restoration reaches. The risks for impacts to riparian areas containing special status fish and aquatic invertebrate species are the same for all three alternatives; they pose the least risk for impacts of all alternatives. It would have one mile of PFC rated stream in expected wind energy development areas which is the same as Alternative V. Alternative IV, similar to Alternative V would pose the second least risk for impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species due to expected wind energy development.

Impacts from Management Specific to Alternative V

ROW exclusion areas for Alternative V would include 148 miles of perennial stream and 12 miles of restoration reaches. ROW exclusion areas are the same as described for Alternative IV with the addition of Lands with Wilderness Characteristics along the Bruneau River and Jarbidge River. PFC ratings were completed on 68 miles of these streams; 25 miles are Priority 1 and Priority 2 reaches. Alternative V would have the most miles of special status fish and aquatic invertebrate species habitat in ROW exclusion areas of all alternatives. ROW avoidance areas would encompass 295 miles of perennial stream and 35 miles of restoration reaches; basically the same miles as for Alternative VI which is more than for the other alternatives. The ROW avoidance areas would include the same areas described for Alternative I with the addition of the redband trout streams in the Jarbidge Foothills included in the Sagebrush Sea ACEC. ROWs may be granted in this area if a site-specific analysis determines PFC and HC ratings would not be reduced. Alternative V would have two fewer miles of perennial stream and the same miles of HC rated reaches in ROW avoidance areas as Alternative VI. It would pose slightly more risk for impacts to special status fish and aquatic invertebrate species than Alternative VI. Areas available for ROWs would encompass 22 miles of perennial streams. HC ratings are not available for any of these streams. PFC ratings were completed on 11 of these miles; 8 miles are Priority 1 and 2 reaches and would have risk for impacts to riparian conditions due to ROW authorizations. Alternative V would pose the least risk for impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species of all alternatives.

Utility ROW corridors would be in the same areas as described in Alternative I. The impacts to riparian and habitat conditions in areas containing special status fish and aquatic invertebrate species would be the same as Alternative I.

Expected wind energy development areas for Alternative V would impact the same perennial streams as Alternatives I and IV; the least of all alternatives. None of these miles include conservation or restoration reaches. The expected wind energy development areas would encompass less than one mile of PFC rated reaches. Alternative V, similar to Alternative IV would pose the second least risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wind energy development.

Impacts from Management Specific to Alternative VI (Proposed RMP)

ROW exclusion areas would include the same miles of perennial stream, restoration reaches, and PFC rated reaches as Alternatives I and III. Alternative VI would have fewer miles of special status fish and aquatic invertebrate species habitat in ROW exclusion areas than Alternatives IV and V, but more than the other alternatives. Alternative VI would rank third in miles of special status fish and aquatic invertebrate species habitat in ROW exclusion areas. ROW avoidance areas would encompass 297 miles of perennial stream and 35 miles of restoration reaches; basically the same miles as for Alternative V which is more than for the other alternatives. The ROW avoidance areas would include the same areas as Alternative V and an additional two miles of perennial stream. Alternative VI would pose the fewest risk for impacts to special status fish and aquatic invertebrate species related to ROW avoidance areas of all alternatives, similar to Alternative V. Areas available for ROWs would encompass 21 miles of perennial streams, the fewest of all alternatives. HC ratings are not available for any of these streams. PFC ratings were completed on seven of these miles, which are Priority 1 and 2 reaches and would be at risk for impacts to riparian condition due to ROW authorizations. Alternative VI would have the fewest miles of special status fish and aquatic invertebrate species habitat in areas available for ROW authorizations.

ROW corridors for utility development would include six miles of perennial streams. This alternative would allow ROWs for buried utilities in addition to the overhead utility ROWs for the other alternatives. The buried ROW utility corridors would encompass less than two miles of Priority 1 and 2 reaches. Alternative VI would pose fewer risks to riparian areas containing special status fish and aquatic invertebrate species than Alternatives I, II, III, IV, and V but less than the No Action Alternative.

Expected wind energy development areas for Alternative VI would include nine miles of perennial stream. None of these miles include conservation or restoration reaches. Alternative VI would include seven miles of PFC rated reaches in expected wind energy development areas. Alternative VI would pose the third most risk for impacts to riparian and habitat condition in areas containing special status fish and aquatic invertebrate species due to wind energy development.

Impacts from Minerals Actions

The impacts to habitat condition (HC) ratings for any minerals development in the Riparian Conservation Area (RCA) would be primarily related to streambank and streambed alteration, removal of riparian vegetation, sediment introductions to streams from surface-disturbing activities such as road construction and maintenance, facilities development and operation, and general impacts to water quality and quantity. Restoration reaches are at more risk for further reduction in condition and less likely to improve when in areas open to mineral development. Conservation reaches are more resilient to impacts associated with mineral development. These areas are still at risk for a reduction in condition due to minerals exploration or development, but at less risk than if they were in a reduced condition.

Seasonal use restrictions for mineral development are expected to reduce the potential for impacts to special status fish and aquatic invertebrate species from surface-disturbing activities or occupancy in the RCA. Closing RCAs to mineral development during spawning periods would protect special status fish spawning and reproduction, but activities in the RCA during other times of the year would reduce HC ratings in special status fish and aquatic invertebrate species habitats. Some aspects of oil and gas or geothermal development, such as blasting, consumptive and non-consumptive use of surface or groundwater, disposal of wastewater, and general surface disturbance in the RCA, would reduce HC ratings where these activities occur. Blasting activities may result in negative impacts to special status fish and aquatic invertebrate species, particularly during spawning, incubation, or other reproductive stages. The impacts to special status fish from directional drilling to access geothermal or oil and gas resources can be difficult to quantify. Geothermal leasing near the Lower Bruneau Canyon Area of Critical Environmental Concern would pose a threat to subsurface geothermal resources that support Bruneau hot springsnails. No surface occupancy restrictions would avoid direct impacts to RCAs containing special status fish and aquatic invertebrate species, but indirect impacts to HC ratings would occur where minerals exploration or development occurs in the RCA at any time of the year.

Locatable mineral exploration and development usually occurs in RCAs and can result in disturbances to the streambed, streambank, streamflow, streamside vegetation, and other RCA components. Water

quality can be reduced as a result of chemicals used in the mineral extraction process (Nelson et al., 1991). The impacts from these projects can result in a long-term reduction in HC ratings in RCAs containing special status fish and aquatic invertebrate species and their habitats. The more miles of restoration reaches in areas recommended for withdrawal, the fewer risk for reduction in these ratings from locatable mineral development. Impacts to special status fish and aquatic invertebrate species and their habitats from locatable mineral development are not expected where RCAs are withdrawn from development due to statute (e. g., Wilderness, Wild and Scenic River [WSR], Wilderness Study Area).

Table 4-153 through Table 4-160 display the miles of perennial stream and conservation and restoration reaches within leasable, salable, and locatable mineral allocation areas.

Table 4-153. Leasable Mineral Allocations for Perennial Streams in Expected Oil and Gas Areas by Alternative (Miles)

Leasable Mineral Allocation	Alternative					
	I	II	III	IV	V	VI
Open	2	39	39	3	11	3
Open - No Surface Occupancy	2	27	0	2	2	2
Open - Seasonal and Controlled Surface Use Restrictions	24	0	0	20	19	26
Open - Seasonal Restrictions	10	0	0	9	0	10
Open - Controlled Surface Use Restrictions	20	25	25	21	17	24
Closed	34	1	28	38	44	28

Table 4-154. Leasable Mineral Allocations for Streams with Habitat Condition Data in Expected Oil and Gas Areas by Alternative (Miles)

HC Rating	Alternative					
	I	II	III	IV	V	VI
Open						
Conservation	0	5	5	0	0	0
Restoration	0	7	7	0	0	0
Open - No Surface Occupancy						
Conservation	0	0	0	0	0	0
Restoration	0	2	0	0	0	0
Open - Seasonal and/or Controlled Restrictions						
Conservation	5	0	0	2	2	5
Restoration	8	< 1	< 1	6	6	8
Closed						
Conservation	0	0	0	3	3	0
Restoration	2	0	2	4	4	2

Table 4-155. Leasable Mineral Allocations for Perennial Streams in Expected Geothermal Areas by Alternative (Miles)

Leasable Mineral Allocation	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
High Potential							
Open	0	1	1	0		0	0
Open–No Surface Occupancy	0	0	0	0		0	0
Open–Seasonal and/or Controlled Restrictions	1	0	0	1		1	1
Closed	6	6	6	6		6	6

Leasable Mineral Allocation	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Medium Potential							
Open	2	13	13	3		2	3
Open–No Surface Occupancy	1	19	0	1		1	1
Open–Seasonal and/or Controlled Restrictions	14	10	10	20		14	20
Closed	27	3	21	21		27	21
Low Potential							
Open	0	86	86	0	0	11	0
Open–No Surface Occupancy	1	48	0	1	1	1	1
Open–Seasonal and/or Controlled Restrictions	115	35	35	100	102	94	115
Closed	151	96	144	166	163	160	151

Table 4-156. Leasable Mineral Allocations for Streams with Habitat Condition Data in Expected Geothermal Areas by Alternative (Miles)[A]

HC Rating	Alternative					
	I	II	III	IV	V	VI
Open						
Conservation	5	18	5	2	2	5
Restoration	23	31	23	16	21	13
Closed						
Conservation	13	< 1	13	18	16	23
Restoration	11	3	11	16	13	11

[A] The table only depicts areas with low potential for geothermal leasing since there are no conservation or restoration reaches in areas with high or medium potential.

Table 4-157. Salable Mineral Allocations for Perennial Streams by Alternative (Miles)

Salable Mineral Allocation	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Open	138	203	144	123	125	122	138
Closed	180	114	154	194	192	192	180

Table 4-158. Salable Mineral Allocations for Streams with Habitat Condition Data by Alternative (Miles)

HC Rating	Alternative					
	I	II	III	IV	V	VI
Open						
Conservation	5	18	5	2	2	5
Restoration	23	31	24	18	21	23
Closed						
Conservation	13	< 1	13	16	16	13
Restoration	11	3	11	16	13	11

Table 4-159. Locatable Mineral Allocations for Perennial Streams by Alternative (Miles)

Locatable Mineral Allocations	Alternative					
	I	II	III	IV	V	VI
Available	132	144	144	135	139	232
Recommended Withdrawn	100	87	87	97	93	0
Withdrawn by Statute	84	84	84	84	84	84

Table 4-160. Locatable Mineral Allocations for Streams with Habitat Condition Data by Alternative (Miles)

HC Rating	Alternative					
	I	II	III	IV	V	VI
Conservation	13	13	13	13	13	< 1
Restoration	8	8	8	11	8	3

[A] All alternatives include less than four miles of conservation and restoration reaches in areas withdrawn from locatable mineral development by statute.
[B] Alternative VI does not include any areas recommended for withdrawal from locatable mineral development.

The following indicator was used to analyze the impacts of Minerals actions on special status fish and aquatic invertebrates:

- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative allows for mineral leasing in riparian areas, but with a no surface occupancy stipulation within 500 feet of the riparian area; there are currently no active mineral leases. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. No mineral material sources have been developed that affected riparian areas containing special status fish and aquatic invertebrate species. The allocation for locatable minerals recommends the Bruneau-Jarbidge and Sand Point Areas of Critical Environmental Concern (ACECs); Wilderness; and the Bruneau, Jarbidge, and Salmon Falls Creek Canyons to be withdrawn from mineral entry. This withdrawal would reduce the potential for locatable mineral exploration and development to impact special status fish and aquatic invertebrate species and their habitats within these areas.

Leasable, salable, and locatable minerals exploration and development would be expected to have localized impacts to HC ratings for streams containing special status fish and aquatic invertebrate species. However, according to the Reasonably Foreseeable Development Scenario (RFDS) for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. Similarly, according to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur in the planning area as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing. Salable mineral development is expected to occur on approximately 0.2% of the area available for salable mineral development. Demand for locatable minerals in the planning area is not expected to change from present levels.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All alternatives would have the Bruneau-Jarbidge Rivers Wilderness and designated WSR corridors withdrawn from locatable mineral development by statute. For all alternatives, this would result in 84 miles of perennial stream being unavailable for locatable mineral development. HC ratings would be maintained or improved under wilderness management.

Impacts from Management Common to All Action Alternatives

Management actions for leasable, salable, and locatable mineral developments would be implemented consistent with the goals, objectives and management actions for water resources, riparian areas and wetlands, fish, and special status species, which would reduce the risk potential for impacts to HC ratings in habitats occupied by special status fish and aquatic invertebrate species . The Aquatic and Riparian Management Strategy provides direction for conserving high quality habitats and restoring impaired habitats so that HC ratings are improved over the long term. Site-specific analysis would assure actions encroaching on the RCA do not impair the attainment of management objectives. All action alternatives would comply with Endangered Species Act (ESA) consultations where mineral exploration or development has the potential to impact habitats for ESA-listed species or their habitats.

Impacts from Management Specific to Alternative I

There would be 58 miles of perennial stream in expected oil and gas areas open to leasing; 56 miles of stream would be open to leasing with surface use restrictions; 34 miles would be closed to oil and gas leasing. There would be five miles of conservation reaches and eight miles of restoration reaches in areas open with surface use restrictions for oil and gas development. Alternative I is expected to have fewer impacts to special status fish and aquatic invertebrate species and their habitat than the No Action Alternative. According to the RFDS for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur due to oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for leasing. Alternative I would have fewer miles of perennial stream in expected oil and gas areas than Alternatives II, III, and VI and the same miles of conservation and restoration reaches in areas open to oil and gas development as Alternative VI. It would pose the third least risk to habitat condition for streams containing special status fish and aquatic invertebrate species due to oil and gas development of all action alternatives.

There would be 134 miles of perennial stream in areas open and 184 miles of perennial stream in areas closed to geothermal leasing. For the areas open to geothermal leasing, 132 miles would have surface use restrictions to reduce the potential for impacts to perennial streams, which are the most restrictions of all alternatives. There would be 5 miles of conservation reaches and 23 miles of restoration reaches in areas open to geothermal leasing. According to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing. Alternative I would have the fourth most miles of perennial stream in areas open to geothermal leasing of all alternatives and the second most miles of conservation and restoration reaches in areas open to geothermal development. Alternative I would pose the third most risks for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to geothermal development of all action alternatives, after Alternatives II and III.

There would be 138 miles of perennial stream in areas open and 180 miles of perennial stream in areas closed to salable mineral development. There would be 5 miles of conservation reaches and 23 miles of restoration reaches in areas open to salable mineral development. The areas closed to salable mineral development coincide with the special status fish and aquatic invertebrate species habitats in the Bruneau River, Jarbidge River and its tributaries, most of the Snake River, most of Salmon Falls Creek and portions of the Snake River. Since these areas would be closed to salable mineral development, impacts to special status fish and aquatic invertebrate species are not expected due to salable minerals. In areas with special status species habitat open to salable minerals development, there would be an increased risk for impacts to HC ratings due to salable minerals. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. No salable mineral sources are currently in special status fish and aquatic invertebrate species habitat. Salable mineral development is expected to occur on approximately 0.2% of the area available for salable mineral development. Alternative I, similar to Alternative VI would pose fewer impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to salable mineral development than Alternatives II and III.

There would be 132 miles of perennial stream in areas available for locatable mineral development and 184 miles in areas recommended for withdrawal or withdrawn by statute. This alternative has the fewest perennial stream miles in areas available to locatable minerals development of all alternatives. There would be 13 miles of conservation reaches and 8 miles of restoration reaches in areas recommended for withdrawal from locatable mineral development. The areas recommended for withdrawal would coincide with designated critical habitat for bull trout and redband trout habitats in the Wilderness, the redband trout habitat in the Salmon Falls Creek ACEC and portions of upper Salmon Falls Creek and Rocky Canyon Creek, and the Snake River snail and white sturgeon habitats in the Snake River in the Middle Snake and Sand Point ACECs. The redband trout streams in the Jarbidge Foothills and the Bruneau hot springsnail habitat would be available for locatable minerals development with surface use restrictions. Demand for locatable minerals in the planning area is not expected to change from present levels. Alternative I would pose the least risk to impacts to special status fish and aquatic invertebrate species due to locatable mineral development of all action alternatives.

Impacts from Management Specific to Alternative II

There would be 91 miles of perennial stream in expected areas open to oil and gas leasing; 52 miles of stream would be open to leasing with surface use restrictions and 1 mile would be closed to oil and gas development. There would be 5 miles of conservation reaches and 10 miles of restoration reaches in areas open to oil and gas development. Alternative II would have the most perennial stream miles and conservation and restoration reaches in areas open to oil and gas development of all alternatives; therefore, it would pose the greatest risk to habitat condition for streams containing special status fish and aquatic invertebrate species due to oil and gas development.

There would be 216 miles of perennial stream in areas open and 105 miles of perennial stream in areas closed to geothermal leasing. For the areas open to geothermal leasing, 112 miles would have surface use restrictions to reduce the potential for impacts to perennial streams. There would be 18 miles of conservation reaches and 31 miles of restoration reaches in areas open to geothermal leasing. Alternative II would have the most miles of perennial stream and the most miles of conservation and restoration reaches in areas open to geothermal leasing of all alternatives. The impacts for this alternative would be similar to Alternative I, except more miles of perennial streams and conservation and restoration reaches would be in areas open to geothermal development. Alternative II would have the most risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to geothermal development.

There would be 203 miles of perennial stream in areas open and 114 miles of perennial stream in areas closed to salable mineral development. The areas closed to salable mineral development include the Jarbidge River canyon, most of the Bruneau River and portions of Salmon Falls Creek. This alternative would have the most perennial stream miles in areas open to salable mineral development of all alternatives. There would be 31 miles of restoration reaches in areas open to salable mineral development. Alternative II would pose the most risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due of all action alternatives due to salable mineral development.

There would be 144 miles of perennial stream in areas available for locatable minerals development and 171 miles in areas recommended for withdrawal or withdrawn by statute. This alternative would have the second most perennial stream miles in areas available for locatable mineral development of all alternatives; the same as for Alternative III. The miles of conservation and restoration reaches recommended to be withdrawn from locatable mineral development would be the same as Alternatives I, III, and V. The areas available for and recommended for withdrawal from locatable mineral development or withdrawn by statute would generally coincide with the areas identified in Alternative I, except the closures would be limited to eligible and suitable WSRs instead of ACEC boundaries. The impacts of locatable mineral development on special status fish and aquatic invertebrate species are similar to Alternative I, except more stream miles would be available for locatable mineral development. Alternative II, similar to Alternative III would pose the second most risk for impacts to special status fish and aquatic invertebrate species due to locatable mineral development.

Impacts from Management Specific to Alternative III

There would be 64 miles of perennial stream in expected areas open to oil and gas leasing; 25 miles of stream would be open to leasing with surface use restrictions and 28 miles would be closed to oil and gas development. There would be five miles of conservation reaches and eight miles of restoration reaches in areas open for oil and gas development. Alternative III would have the third most miles of perennial stream in areas open to oil and gas development of all alternatives; less than Alternatives II and VI, but more than the other alternatives. Alternative III would have two fewer miles of restoration reaches in areas open to oil and gas development than Alternative II, but the same as Alternatives I and VI. The impacts for this alternative would be similar to Alternative II, although there would be 27 fewer miles of perennial stream and slightly fewer miles of restoration reaches in areas open to oil and gas development in Alternative III. Alternative III would pose the second most risk to habitat condition for streams containing special status fish and aquatic invertebrate species due to oil and gas development.

There would be 145 miles of perennial stream in areas open and 171 miles of perennial stream in areas closed to geothermal leasing. For the areas open to geothermal leasing, 45 miles would have surface use restrictions to reduce the potential for impacts to perennial streams. There would be 5 miles of conservation reaches and 23 miles of restoration reaches in areas open to geothermal leasing. Alternative III would have fewer miles of perennial stream in areas open to geothermal leasing than Alternative II, but more than the other alternatives. The impacts of this alternative would be similar to Alternative II except there is less potential for special status species and their habitats in the Snake River and redband trout habitat in Salmon Falls Creek to be impacted by geothermal development. Alternative III would have the same miles of conservation and restoration reaches in areas open to geothermal development as Alternative I; the impacts to special status fish and aquatic invertebrate species in these reaches are the same as Alternative I. Alternative III would pose the second most risk to habitat condition for streams containing special status fish and aquatic invertebrate species due to geothermal development.

There would be 144 miles of perennial stream in areas open and 154 miles of perennial stream in areas closed to salable mineral development. The areas closed to salable mineral development would be the same as in Alternative I except Lands with Wilderness Characteristics would not be closed in Alternative III. This alternative would have fewer perennial stream miles open to salable mineral development than Alternative II, but more than the other alternatives. There would be 24 miles of restoration reaches in areas open to salable minerals. The impacts of salable minerals development on special status fish and aquatic invertebrate species in Alternative III would be similar to Alternative I, except there would be more miles of perennial stream and one additional mile of restoration reaches in areas open to salable minerals. Alternative III would pose the second most risk of impact to habitat condition for streams containing special status fish and aquatic invertebrate species due of all action alternatives due to salable mineral development, after Alternative II.

Alternative III would have the same miles of perennial stream in areas available for locatable minerals development as Alternative II, which is the second most of all alternatives. The miles of conservation and restoration reaches in areas recommended for withdrawal or withdrawn by statute from locatable minerals would be the same as Alternative II. The impacts to special status fish and aquatic invertebrate species and their habitat from locatable mineral development would be the same as Alternative II. Alternative III, similar to Alternative II would pose the second most risk for impacts to special status fish and aquatic invertebrate species due to locatable mineral development.

Impacts from Management Specific to Alternative IV

There would be 55 miles of perennial stream in expected areas open to oil and gas leasing; 52 miles would be open to leasing with surface use restrictions and 38 miles would be closed to oil and gas development. There would be two miles of conservation reaches and six miles of restoration reaches open with surface use restrictions for oil and gas development. This alternative would have fewer perennial stream miles and fewer miles of conservation and restoration reaches in expected oil and gas areas than Alternatives I, II, III, and VI. Alternative IV would pose the second least risk to habitat condition for streams containing special status fish and aquatic invertebrate species due to oil and gas development.

There would be 126 miles of perennial stream in areas open and 193 miles in areas closed to geothermal leasing; Alternative IV-B varies from Alternative IV-A with one additional mile open to development. There would be 2 miles of conservation and 16 miles of restoration reaches in areas open to geothermal leasing. Of the perennial miles open to geothermal leasing, 123 miles would have surface use restrictions to reduce the potential for impacts to perennial streams. The impacts for this alternative would be similar to Alternative I, except fewer miles of perennial streams and conservation and restoration reaches would be in areas open to geothermal development. Alternative IV, similar to Alternative VI would have the fewest miles of conservation and restoration reaches containing special status fish and aquatic invertebrate species in areas open for geothermal leasing of all alternatives. Alternative IV would pose the least risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to geothermal development.

There would be 123 miles of perennial stream in areas open to salable mineral development; an additional 2 miles of Clover Creek would be open in Alternative IV-B. The areas closed to salable mineral development would include 194 miles of perennial stream in Alternative IV-A and 192 perennial miles for Alternative IV-B, respectively. The areas closed to salable mineral development would be the same as described for Alternative I. There would be 18 miles of restoration reaches in areas open to salable mineral development. The impacts of salable minerals development in Alternative IV would be similar to Alternative I, except there would be fewer miles of perennial stream and restoration reaches in areas open to salable minerals development. Alternative IV would have the second fewest miles of perennial stream and the fewest miles of restoration reaches in areas open to salable mineral development of all alternatives. Alternative IV would pose the least risk of impact to habitat condition for streams containing special status fish and aquatic invertebrate species due to salable mineral development.

There would be 135 miles of perennial stream in areas available for locatable minerals development and 181 miles would be in areas recommended for withdrawal or withdrawn by statute. This alternative would have the second fewest perennial stream miles in areas available for locatable mineral development of all alternatives; more than Alternative I but less than the other action alternatives. This alternative has 13 miles of conservation reach and 11 miles of restoration reaches in areas recommended for withdrawal or withdrawn by statute from locatable development, the most of all alternatives. The impacts of locatable mineral development on special status fish and aquatic invertebrate species and their habitats would be similar to those described for Alternative I, except that 3 more stream miles would be available for locatable mineral development in Alternative IV. Alternative IV would pose the second least risk to impacts to special status fish and aquatic invertebrate species due to locatable mineral development.

Impacts from Management Specific to Alternative V

There would be 49 miles of perennial stream in expected areas open to oil and gas leasing; 38 miles would be open to leasing with surface use restrictions and 44 miles of stream would be closed to oil and gas development. Alternative V would have the least perennial stream miles in areas open to oil and gas development of all alternatives. Two miles of conservation reaches and six miles of restoration reaches would be in areas open to oil and gas leasing, which is the same as for Alternative IV but less than other alternatives. Alternative V would pose the least risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to oil and gas development.

There would be 124 miles of perennial stream in areas open and 193 miles in areas closed to geothermal leasing. Of the areas open to geothermal leasing, 111 miles would have surface use restrictions to reduce the potential for impacts to perennial streams. There would be 2 miles of conservation reaches and 21 miles of restoration reaches in areas open to geothermal leasing. Alternative V would have the fewest miles of perennial stream in areas open to geothermal leasing of all alternatives, and the second fewest miles of conservation and restoration reaches in areas open to geothermal development. The impacts for this alternative would be similar to Alternative I, except fewer miles of perennial streams and conservation and restoration reaches would be in areas open to geothermal development. Alternative V would have the second least risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to geothermal development.

There would be 122 miles of perennial stream in areas open and 192 miles in areas closed to salable mineral development. This alternative would have the fewest miles of perennial stream in areas open to salable mineral development of all alternatives. The 21 miles of restoration reaches in areas open to salable mineral development would be more than Alternative IV but less than other alternatives. Alternative V would pose the second least risk of impact to habitat condition for streams containing special status fish and aquatic invertebrate species due to salable mineral development.

There would be 139 miles of perennial stream in areas available for locatable minerals development and 177 miles in areas recommended for withdrawal or withdrawn by statute. Alternative V would encompass more miles of perennial stream in areas available for locatable mineral development than Alternatives I and IV, but fewer than Alternatives II, III, and VI. The 13 miles of conservation and 8 miles of restoration reaches in areas recommended for withdrawal or withdrawn by statute from locatable mineral development would be the same as in Alternatives I, II, and III. The effects of locatable mineral development on special status fish and aquatic invertebrate species and their habitats would be similar to Alternative I, except seven more perennial stream miles would be available for locatable mineral development. Alternative V would pose the third least risk to impacts to special status fish and aquatic invertebrate species due to locatable mineral development.

Impacts from Management Specific to Alternative VI (Proposed RMP)

There would be 65 miles of perennial stream in expected areas open to oil and gas leasing; 62 miles of stream would be open to leasing with surface use restrictions and 28 miles of stream would be closed to oil and gas development. There would be five miles of conservation reaches and eight miles of restoration reaches in areas open with surface use restrictions for oil and gas development. Alternative VI would have similar miles of perennial stream in areas open to oil and gas as Alternative III, although more stream miles would have surface use restrictions in Alternative VI. Therefore, it would have less risk for impacts to HC ratings. The miles of conservation and restoration reaches available for leasing would be the same as for Alternative III; the impacts to special status fish and aquatic invertebrate species and their habitat would be the same as Alternative III. It would pose the third greatest risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to oil and gas development.

There would be 141 miles of perennial stream in areas open and 178 miles of perennial stream in areas closed to geothermal leasing. Of the areas open to geothermal leasing, 138 miles would have surface use restrictions to reduce the potential for impacts to perennial streams. There would be 5 miles of conservation reaches and 13 miles of restoration reaches in areas open to geothermal leasing. Alternative VI would have fewer miles of perennial stream in areas open to geothermal leasing than Alternatives II and III, but more than the other alternatives. Alternative VI would have less risk to special status fish and aquatic invertebrate species from geothermal development than Alternatives II and III; Alternative VI would have the fewest miles of restoration reach in areas open to geothermal development and the second most surface use restrictions of all alternatives. Alternative VI would have the third least risk for impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to geothermal development.

There would be 138 miles of perennial stream in areas open and 180 miles in areas closed to salable mineral development. This alternative would have the same miles of perennial stream in areas open and closed to salable mineral development as Alternative I. The 23 miles of restoration reaches in areas open to salable mineral development would be the same as for Alternative I. Alternative VI; similar to Alternative I would have fewer impacts to habitat condition for streams containing special status fish and aquatic invertebrate species due to salable mineral development than Alternatives II and III.

There would be 232 miles of perennial stream in areas available for locatable mineral development and 84 miles would be in areas withdrawn by statute from locatable mineral development; no areas would be recommended for withdrawal from locatable minerals. This alternative would have more perennial stream miles in areas available for locatable mineral development than any other alternative. This alternative has less than one mile of conservation reach and three miles of restoration reaches in areas withdrawn by statute, which is the least of all alternatives. The impacts of locatable mineral development on streams

containing special status fish and aquatic invertebrate species would be similar to those described for Alternative I, except 100 more stream miles would be available for locatable mineral development in Alternative VI. Alternative VI would pose the most risk for impacts to special status fish and aquatic invertebrate species due to locatable mineral development.

Impacts from Areas of Critical Environmental Concern Actions

The management actions for each Area of Critical Environmental Concern (ACEC) are designed to maintain or improve relevant and important values for special status fish and aquatic invertebrate species, where they exist, by modifying or eliminating activities that impact these species or impair their habitats. Modifications in transportation and travel, infrastructure, wildland fire suppression, mineral withdrawal, livestock grazing, and restoration treatments would support or maintain values for the ACECs overall, but not all actions would directly improve proper functioning condition (PFC) or habitat condition (HC) ratings for Riparian Conservation Areas (RCAs) containing special status fish and aquatic invertebrate species. Restoration reaches not at PFC in ACECs are at less risk for further reduction in condition and more likely to improve than areas not in ACECs because of the increased management emphasis on activities that would impair PFC and HC ratings. Conservation reaches at PFC are more resilient to land use activities and are more likely to be maintained in their current condition through ACEC designation than if not included in an ACEC. The ACECs which contain RCAs and are encompassed in Wilderness or Wild and Scenic River (WSR) designations would improve and be maintained in a fully functioning condition under this management direction.

Of the 15 nominated ACECs, all but 6 (the Inside Desert (large and small), Jarbidge Foothills (small), Lower Bruneau Canyon (small), and Sand Point ACECs) have at least one special status fish and aquatic invertebrate species as a relevant and important value. Table 4-161 identifies ACECs with relevant and important values for special status fish and aquatic invertebrates. Table 4-162 identifies the miles of perennial stream with relevant and important values for special status fish and aquatic invertebrate species in each ACEC by alternative. Table 4-163 displays conservation and restoration reaches within each ACEC by alternative.

Management actions that reduce the amount of sediment entering fish-bearing streams, promote healthy riparian vegetation, and improve and maintain water quality would ultimately improve the PFC and HC ratings for streams containing special status fish and aquatic invertebrate species. The amount of improvement would vary by ACEC and management changes. In general, ACECs that include the Bruneau-Jarbidge Canyon would improve PFC and HC ratings for bull trout and their designated critical habitat and redband trout, ACECs that include the Jarbidge Foothills and Salmon Falls Creek would improve PFC and HC ratings for redband trout, and the Lower Bruneau Canyon ACEC would improve PFC ratings for the Bruneau hot springsnail. ACECs that include the Snake River would support the recovery efforts for the Snake River, but improvement in habitat condition for Snake River snails and Snake River white sturgeon would be limited. The primary factors that have contributed to the special status designation for these species are related to flow alteration and water quality concerns due to the hydroelectric development of the Snake River (FWS, 1995).

Table 4-161. Areas of Critical Environmental Concern with Relevant and Important Values for Special Status Fish and Aquatic Invertebrates

ACEC	Bruneau Hot Springsnail	Bull Trout	Redband Trout	Snake River Snails	White Sturgeon
Bruneau-Jarbidge		X	X		
Jarbidge Foothills [A]			X		
Lower Bruneau Canyon[B]	X	X			
Middle Snake			X	X	X
Sagebrush Sea		X	X		
Salmon Falls Creek			X		
Upper Bruneau Canyon			X		

[A] Redband trout are not included as a relevant and important value in the Jarbidge Foothills ACEC with the small boundary.

[B] Bruneau hot springsnail and bull trout are not included as a relevant and important value in the Lower Bruneau Canyon ACEC with the small boundary.

Table 4-162. Perennial Streams in Areas of Critical Environmental Concern Containing Relevant and Important Special Status Fish and Aquatic Invertebrate Species Values by Alternative (Miles)

ACEC	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Bruneau-Jarbidge	96	96	NA	49	104		NA	NA
Inside Desert	NA	NA	NA	NA	0	NA	NA	NA
Jarbidge Foothills	NA	NA	NA	NA	41	NA	NA	NA
Lower Bruneau Canyon	NA	2	NA	NA	2		2	0
Middle Snake	NA	11	NA	NA	NA		11	NA
Sagebrush Sea	NA	NA	NA	NA	NA		201	NA
Salmon Falls Creek	31	31	NA	31	NA		NA	31
Sand Point	NA	NA	NA	NA	NA		NA	NA
Upper Bruneau Canyon	NA	NA	NA	NA	NA	NA	NA	14
Total	**127**	**140**	**0**	**80**	**147**	**106**	**214**	**45**

Note: NA indicates the ACEC would not be designated for the alternative.

Table 4-163. Conservation and Restoration Reaches in Areas of Critical Environmental Concern Containing Relevant and Important Special Status Fish and Aquatic Invertebrate Species Values by Alternative (Miles)

HC Rating [A]	Alternative							
	No Action	I	II	III	IV		V	VI[B]
					IV-A	IV-B		
Bruneau-Jarbidge								
Conservation	7	7	NA	< 1	13		NA	NA
Restoration	8	8	NA	3	12		NA	NA
Total	**15**	**15**	**0**	**4**	**25**		**0**	**0**
Jarbidge Foothills								
Conservation	NA	NA	NA	NA	5	NA	NA	NA
Restoration	NA	NA	NA	NA	21	NA	NA	NA
Total	**0**	**0**	**0**	**0**	**26**	**0**	**0**	**0**
Sagebrush Sea								
Conservation	NA	NA	NA	NA	NA		18	NA
Restoration	NA	NA	NA	NA	NA		34	NA
Total	**0**	**0**	**0**	**0**	**0**		**52**	**0**
Grand Total	**15**	**15**	**0**	**4**	**51**	**34**	**52**	**0**

[A] There are no conservation or restoration reaches in the Inside Desert, Lower Bruneau Canyon, Middle Snake, Salmon Falls Creek, and Sand Point ACECs.
[B] There are no HC ratings for ACECs in Alternative VI.
Note: NA indicates the ACEC would not be designated for the alternative.

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern actions on special status fish and aquatic invertebrates:

- Riparian condition and
- Habitat condition for special status fish species.

Impacts from Management Specific to the No Action Alternative

Management associated with the Bruneau-Jarbidge and Salmon Falls Creek ACECs would continue to reduce impacts to special status fish and aquatic invertebrate species habitats in approximately 127 miles of perennial stream. The Bruneau-Jarbidge ACEC includes 96 miles of perennial stream, of which 77 miles contain bull trout or their designated critical habitat and 96 miles contain redband trout. There are seven miles of conservation reaches and eight miles of restoration reaches in the Bruneau-Jarbidge

ACEC. The Salmon Falls Creek ACEC includes 31 miles of redband trout habitat in Salmon Falls Creek. Both of the ACECs receive a limited amount of human use due to the steep canyon walls that limit access. The impacts to riparian and habitat conditions are primarily related to recreational uses and an increased occurrence of invasive plants. ACEC management for the No Action Alternative is special status fish and aquatic invertebrate species expected to maintain PFC and HC ratings, which would maintain riparian and habitat condition for special status fish and aquatic invertebrate species over the life of the plan. The No Action Alternative would rank fourth in miles of priority reaches within ACECs. It would have fewer risks for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species than Alternatives II, III, and VI but more than the other alternatives.

Impacts from Management Specific to Alternative I

Alternative I would designate four ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, Salmon Falls Creek, and Sand Point ACECs. These ACECs would include 140 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value. These ACECs encompass seven miles of conservation reaches and eight miles of restoration reaches; the same as for the No Action Alternative, more than for Alternatives II, III, and VI but less than Alternatives IV and V. Alternative I would rank third in miles of perennial stream and fourth in miles of restoration reaches within ACECs.

The Bruneau-Jarbidge ACEC would include most of the designated critical habitat for bull trout except for portions along the West Fork of the Jarbidge River and its tributary Deer Creek, Dave Creek and a portion of the lower Bruneau River. There are seven miles of conservation reaches in the Bruneau-Jarbidge ACEC. Management changes for this ACEC would directly or indirectly improve PFC and HC ratings on 96 miles of perennial stream occupied by bull trout and/or redband trout. Identifying the ACEC as a high priority for the treatment of noxious weeds and invasive plants would reduce the potential for non-native vegetation to displace native riparian vegetation. Identifying the ACEC as a critical suppression area would reduce the potential for a reduction in PFC and HC ratings from wildland fire and wildland fire suppression activities. Alternative I contains more management direction for the Bruneau-Jarbidge ACEC than the No Action Alternative. All actions to maintain or improve relevant and important values for the ACEC would comply with the restoration priorities in the Aquatic and Riparian Management Strategy (ARMS; Appendix D, tables D-3, D-4, and D-5) and Endangered Species Act (ESA) consultation, where required, which would minimize the potential to reduce PFC and HC ratings in bull trout and/or redband trout habitat.

The Lower Bruneau Canyon ACEC would encompass a 2-mile reach of the lower Bruneau River and the associated geothermal hot springs. All actions implemented to maintain or improve relevant and important values for the ACEC would promote the maintenance and improvement of riparian condition in the ACEC. The maintenance or improvement of the geothermal hot springs and seeps as a relevant and important value for the ACEC would comply with the recovery plan requirements for the Bruneau hot springsnail and their habitat. Geothermal development is the primary threat to Bruneau hot springsnails (FWS, 2002). Closing the ACEC to mineral leasing would prevent geothermal development in the ACEC. Identifying the ACEC as a high priority for noxious weeds and invasive plant treatments would reduce the potential for non-native vegetation to displace native vegetation. Identifying the ACEC as a critical suppression area would reduce the potential for a reduction in PFC and HC ratings from wildland fire and wildland fire suppression activities. Not recommending the ACEC be withdrawn from locatable mineral development may result in impacts to riparian conditions if development occurs within the RCA.

The Middle Snake ACEC would encompass an 11-mile reach of the Snake. All actions to maintain or improve relevant and important values for the ACEC would promote the maintenance and improvement of riparian condition in the ACEC. Many of the livestock grazing-related impacts to the Snake River have already been mitigated through ESA consultation requirements for Snake River snails. Impacts to BLM Sensitive white sturgeon and their habitat would also be locally reduced from this management direction.

The Salmon Falls Creek ACEC would include approximately 31 miles of redband trout habitat in the Salmon Falls Creek Canyon. Identifying the ACEC as a high priority for the treatment of noxious weeds

and invasive plants would reduce the potential for non-native vegetation to displace native vegetation. Identifying the ACEC as a critical suppression area would reduce the potential for a reduction in PFC and HC ratings from wildland fire and wildland fire suppression activities. The ACEC would remain closed to livestock grazing, ensuring new impacts from livestock would not occur in the ACEC. Closing the ACEC to mineral leasing and salable mineral development and recommending the ACEC for withdrawal from locatable mineral development would ensure that any actions related to these uses would not degrade PFC and HC ratings or result in impacts to special status fish and aquatic invertebrate species or their habitat that would not be consistent with maintaining resource values in the ACEC.

Alternative I would have fewer risks for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species than the No Action Alternative and Alternatives II, III, and VI but more than the other alternatives.

Impacts from Management Specific to Alternative II

Alternative II would remove ACEC designations from the existing Bruneau-Jarbidge and Salmon Falls Creek ACECs; 127 miles of perennial stream with special status fish as a relevant and important value, including 7 miles of conservation reaches and 8 miles of restoration reaches would no longer benefit from ACEC management.

In some locations, riparian areas containing special status fish and aquatic invertebrate species would continue to be protected by Wilderness or Wilderness Study Area (WSA) designations (e.g., Jarbidge River, portions of the Bruneau River and Salmon Falls Creek) or WSR designations (e.g., Jarbidge River, portions of the Bruneau River) or eligible WSRs (e.g., Jarbidge River and its East Fork, portions of Salmon Falls Creek). Because the areas not re-designated as an ACEC would be within Wilderness or WSR corridors, PFC and HC ratings would continue to be maintained or would improve over time. Riparian conditions in the Salmon Falls Creek reaches that would no longer be designated as an ACEC would continue to be maintained by the steep topography of the canyon walls. The development of mineral resources would not occur in areas within the WSA, designated WSRs, or Wilderness, but may occur in other locations not designated as an ACEC, such as the upper Bruneau River. Mineral development in this area would locally reduce PFC and HC ratings in RCAs containing special status fish.

Alternative II would have the most risks for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Management Specific to Alternative III

Alternative III would designate two ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Bruneau-Jarbidge and Salmon Falls Creek ACECs. ACECs designated in this alternative would include 80 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value and 3 miles of restoration reaches. Alternative III would have the second lowest miles of perennial stream within an ACEC. It would rank sixth in miles of perennial streams and fifth in conservation and restoration reaches within ACECs.

The boundary of the Bruneau-Jarbidge ACEC would be reduced compared to the No Action Alternative. The ACEC would include 49 miles of perennial stream, or half of the perennial stream miles in the ACEC in the No Action Alternative. There are three miles of restoration reaches in the ACEC, five miles fewer than the ACEC in the No Action Alternative. The ACEC would not include portions of the designated critical habitat for bull trout in the Jarbidge River or its East Fork or redband trout habitat in the upper and lower Bruneau River or lower Clover Creek. The ACEC would include designated critical habitat for bull trout in the Jarbidge River. The river segments not included in the ACEC are suitable or eligible WSR segments and are expected to be maintained in their current condition. Management actions to maintain or improve relevant and important values for this ACEC are the same as for Alternative I.

The Salmon Falls Creek ACEC would have the same management actions to maintain or improve relevant and important values as Alternative I; the impacts to special status fish and aquatic invertebrate species would be the same as for Alternative I.

Alternative III would have fewer risks for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species than Alternatives II and VI, but more than the other alternatives.

Impacts from Management Specific to Alternative IV

Alternative IV-A would designate three ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Bruneau-Jarbidge, Jarbidge Foothills, and the Lower Bruneau Canyon ACECs. These ACECs would include 147 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value in Alternative IV-A. There would be 33 miles of restoration reaches in ACECs, more in ACECs than all alternatives, except for Alternative V. Alternative IV-A would rank second in the miles of priority reaches within ACECs. It would have more risk for impacts to riparian areas containing special status fish and aquatic invertebrate species than Alternative V but less than the other alternatives.

Alternative IV-B would designate two ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Bruneau-Jarbidge and the Lower Bruneau Canyon ACECs. These ACECs would include 106 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value in Alternative IV-B. There would be 12 miles of restoration reaches in ACECs, the third most after Alternatives IV-A and V. Alternative IV-B would rank fifth in the miles of priority reaches within ACECs. It would have more risk for impacts to riparian areas containing special status fish and aquatic invertebrate species than Alternatives IV-A and V, but less than the other alternatives.

In Alternative IV, the Bruneau-Jarbidge ACEC would be expanded and would include 104 miles of perennial streams with special status fish and aquatic invertebrate species as a relevant and important value, 8 more miles than in the No Action Alternative. These additional miles include designated critical habitat for bull trout in the Jarbidge River and its East Fork. There are 12 miles of restoration reaches in the ACEC, 4 more miles than in the No Action Alternative and Alternative I. This expanded ACEC would provide more improvement in designated critical habitat for bull trout and redband trout habitat than the No Action Alternative and Alternatives I and III.

The Jarbidge Foothills ACEC includes 41 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value and 21 miles of restoration reaches in Alternative IV-A. The management emphasis for the ACEC in Alternative IV-A would be to restore redband trout habitat and reduce habitat fragmentation in redband trout occupied watersheds. The ARMS provides direction for improving riparian conditions and HC ratings for fish-bearing streams that would improve redband trout habitat over time. Although restoration projects would have a localized short-term reduction in PFC or HC ratings, these impacts would be outweighed by the improvements in PFC and HC ratings for RCAs containing redband trout and reduced habitat fragmentation in the long term. In Alternative IV-B, the ACEC contains approximately half of the redband trout habitat in Alternative IV-A, and does not identify redband trout as a relevant and important value for the ACEC. The redband trout habitats that are not included in the ACEC would be at an increased risk for a reduction in PFC and HC ratings.

The Lower Bruneau Canyon ACEC would be managed the same as in Alternative I. The impacts to Bruneau hot springsnail would be the same as in Alternative I.

Alternative IV would have more risks for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species than Alternative V, but less than the other alternatives.

Impacts from Management Specific to Alternative V

Alternative V would designate three ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Lower Bruneau Canyon, Middle Snake, and Sagebrush Sea ACECs. ACECs designated in this alternative would include 214 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value and 34 miles of restoration reaches. This alternative would have the most perennial stream miles and restoration reaches included in an ACEC of all alternatives, posing the least risk for impacts to special status fish and aquatic invertebrate species due to ACEC management.

The Sagebrush Sea ACEC would include 201 perennial stream miles with special status fish and aquatic invertebrate species as a relevant and important value and 34 miles of restoration reaches. Management for the Sagebrush Sea ACEC would emphasize passive restoration actions to improve PFC and HC ratings and reduce habitat fragmentation in redband trout occupied streams. Active restoration actions would be allowed in functioning at risk with a downward trend and non-functioning stream reaches and would have short-term impacts to PFC and HC ratings that would be outweighed by long-term improvements. The substantial reduction in the amount of livestock grazing in the planning area would be expected to result in a substantial improvement in PFC and HC ratings throughout the ACEC. Removing the livestock infrastructure from RCAs may have short-term impacts to PFC and HC ratings that would be outweighed by long-term improvements in riparian and habitat conditions.

The Lower Bruneau Canyon ACEC would be managed the same as in Alternative I, except that livestock grazing would not be allowed in the ACEC. This would contribute to an overall decrease in ground disturbance in the ACEC, but would likely have minimal effects on Bruneau hot springsnail because livestock grazing effects have already been reduced through fencing to exclude livestock from the river and through development of an upland water source away from the canyon. The impacts to Bruneau hot springsnail would be the same as described for Alternative I.

The Middle Snake ACEC would be managed the same as in Alternative I, except livestock grazing would not be allowed in the Asquena pasture. Livestock trailing would be allowed through the ACEC with no overnight stay, resulting in less livestock-related ground disturbance than in the other alternatives. Otherwise, the impacts for the ACEC would be the same as for Alternative I.

Alternative V would have the least risk for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate two ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Upper Bruneau Canyon and Salmon Falls Creek ACECs. These ACECs would include 45 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value; HC ratings are not available for ACECs in Alternative VI. Except for Alternative II, Alternative VI would have the fewest miles of perennial stream and priority reaches within an ACEC of all alternatives.

The Upper Bruneau Canyon ACEC would include 14 miles of redband trout habitat in the Bruneau River above the confluence of the Jarbidge River. Identifying the ACEC as a high priority for the treatment of noxious weeds and invasive plants would reduce the potential for non-native vegetation to displace native vegetation. Identifying the ACEC as a critical suppression area would reduce the potential for a reduction in riparian conditions due to wildland fire and wildland fire suppression activities. Closing the ACEC to mineral leasing and salable mineral development would ensure that any actions related to these uses would not degrade riparian conditions or result in impacts to water quality that would not be consistent with maintaining resource values in the ACEC.

The Salmon Falls Creek ACEC would have the same management actions to maintain or improve relevant and important values as Alternative I; the impacts to special status fish and aquatic invertebrate species are the same as Alternative I.

Alternative VI would pose the second most risk for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species, less than Alternative II but more than the other alternatives.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

The No Action Alternative would have the most risk of reducing proper functioning condition (PFC) and habitat condition (HC) ratings for streams containing special status fish and aquatic invertebrate species of all alternatives. The entire planning area would be managed for full suppression, which would not focus suppression activities on restoration reaches in the event of multiple wildland fire ignitions. This

alternative has the most miles of restoration reaches vulnerable to impacts from livestock grazing, cross-country motorized vehicle use, land use authorizations, and minerals development of all alternatives. Overall, the No Action Alternative would maintain current habitat conditions for special status fish and aquatic invertebrate species, but does not provide specific direction for improving habitat conditions.

Impacts from Alternative I

Alternative I would have less risk of reducing PFC and HC ratings than the No Action Alternative and Alternatives II and III, but more risk than Alternatives IV, V, and VI. The riparian and wetland objectives would maintain 85 miles of stream at PFC, achieve PFC on 60 miles of stream, and move toward PFC on 80 miles of stream over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. Alternative I would have more potential to meet or surpass the riparian management objectives in riparian reaches containing special status fish and aquatic invertebrate species than Alternatives II and III because Alternative I would have fewer authorized uses.

Alternative I would have more miles of perennial stream in critical suppression areas than Alternatives II, III, and VI but less than Alternatives IV and V, which would result in less risk to restoration reaches than for the conditional suppression areas. This alternative would have 94 miles of perennial streams available to livestock grazing and would rank fifth in the amount of authorized livestock grazing of all alternatives. It would pose the third fewest risk for impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to livestock grazing of all alternatives. Alternative I has more miles of conservation and restoration reaches in areas with limited travel designations than the No Action Alternative and Alternative V. There is a larger decrease in route density expected under this alternative than Alternatives II, III, and VI but less of a decrease than expected under Alternatives IV and V. Expected oil and gas areas would include the same miles of conservation and restoration reaches in areas open as Alternative VI, which is less than Alternative II and more than Alternatives III, IV, and V. This alternative would have fewer miles of special status fish and aquatic invertebrate species habitat in an Area of Critical Environmental Concern (ACEC) than Alternatives IV-A and V, but more than the other alternatives.

Overall, Alternative I would result in minor beneficial impacts to habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Alternative II

Alternative II would have less risk of reducing PFC and HC ratings than the No Action Alternative, but more risk than all other action alternatives. The riparian and wetland objectives would maintain 85 miles of stream at PFC and move toward PFC on 140 miles of stream over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. Alternative II would have more authorized uses and fewer miles of special status fish and aquatic invertebrate species habitat achieving PFC of all action alternatives. The increased emphasis on commercial uses would reduce the likelihood of achieving the riparian management objectives more than the other alternatives, except the No Action Alternative.

In Alternative II, the critical suppression areas would include the fewest miles of perennial stream of all action alternatives and would have the most potential for a further reduction in restoration reaches and PFC ratings from wildland fire. Areas available to livestock grazing would include 111 miles of perennial streams. It would pose the second most risk for impacts riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to livestock grazing; less than the No Action Alternative, the same as Alternative III, and more than the other alternatives. This alternative has the most authorized livestock grazing of all alternatives. It would pose the second most risk for impacts riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to livestock grazing; less than the No Action Alternative, the same as Alternative III. Alternative II has more miles of conservation and restoration reaches in areas with limited travel designations than the No Action Alternative and Alternatives I, IV, and V and the same as Alternatives III and VI. Alternative II would have the greatest expected increase in route density of all alternatives. This alternative would have the most miles of conservation and restoration reaches in expected oil and gas and geothermal

development areas of all alternatives. No ACECs would be designated under this alternative, which would result in the most restoration reaches vulnerable to a decline in conditions of all alternatives.

Overall, Alternative II would maintain current habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Alternative III

Alternative III would have less risk of reducing PFC and HC ratings than the No Action Alternative and Alternative II, but more risk than the other alternatives. The riparian and wetland objectives would maintain 85 miles of stream at PFC, achieve PFC on 98 miles of stream, and move toward PFC on 42 miles of stream over the life of the plan. Since improvements in PFC ratings correlate with improvements in HC ratings, similar improvements in HC ratings can be expected. In Alternative III, the attainment of the riparian and wetland objectives are less likely to occur than in Alternative I because of an increased level of authorized resource use and wildland fire suppression infrastructure.

This alternative would have the most wildland fire suppression-related infrastructure, including road and stream crossings, of any alternative. Alternative III would have the second fewest perennial stream miles in critical suppression areas of all action alternatives. Alternative III would have the second most authorized livestock grazing, which is less than Alternative II but more than the other alternatives. Alternative III would have 111 miles of perennial stream available for livestock grazing. It would pose the second most risk for impacts riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to livestock grazing; less than the No Action Alternative, the same as Alternative II, and more than the other alternatives. Alternative III has the same miles of conservation and restoration reaches in areas with limited travel designations as Alternatives II and VI, which is the most of all alternatives. There would be no reduction in route density because routes would be maintained for wildland fire suppression. Alternative III would have more miles of conservation and restoration reaches in expected oil and gas areas than Alternatives IV and V, but less than the other alternatives. This alternative would have more miles of special status fish and aquatic invertebrate species habitat in an ACEC than Alternatives II and VI, but less than the other alternatives.

Overall, Alternative III would result in minor beneficial impacts to habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Alternative IV

Alternative IV would have less risk of reducing PFC and HC ratings than the No Action Alternative and Alternatives I, II, III, and VI, but more risk than Alternative V. The riparian and wetland objectives are the same as Alternatives III, V, and VI. Active restoration is more likely to achieve the riparian and wetland objectives an in a shorter timeframe than passive restoration.

Alternative IV would have more miles of perennial stream in critical suppression areas and less risk to restoration reaches than Alternatives I, II, III, and VI but less than Alternative V, which has the least, posing fewer risks to special status fish and aquatic invertebrate species from wildland fire. This alternative would have the second least acres available to grazing and the second lowest amount of livestock grazing of all alternatives. Areas available to livestock grazing would include 96 and 97 miles of perennial streams in Alternatives IV-A and IV-B, respectively. Alternative IV has more miles of conservation and restoration reaches in areas with limited travel designations than the No Action Alternative and Alternative V, but less than the other alternatives. This alternative would have the second most expected decrease in route density of all alternatives, which would be less than Alternative V but more than the other alternatives. Alternative IV would have the same miles of conservation and restoration reaches in expected oil and gas and geothermal areas as Alternative V, which is the least of all alternatives. Alternative IV-A encompasses the most redband trout habitat within an ACEC of all alternatives. Alternative IV-A would have less miles of special status fish and aquatic invertebrate species habitat in an ACEC than Alternative V, but more than the other alternatives. Alternative IV-B would have more miles of special status fish and aquatic invertebrate species habitat in an ACEC than Alternatives II, III, and VI, but less than the other alternatives.

Overall, Alternative IV would result in major beneficial impacts to habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Alternative V

Alternative V would have less risk of reducing PFC and HC ratings than all other alternatives since it would have the least amount of public land uses. The riparian and wetland objectives are the same as Alternatives III, IV, and VI. Alternative V would result in the same improvements in PFC and HC ratings as Alternative IV, but at a slower rate due to passive restoration techniques.

Alternative V would have the lowest levels of resource uses, which would result in the most improvement in restoration reaches containing special status fish and aquatic invertebrate species habitat of all alternatives. Critical suppression areas would include more miles of perennial stream than all alternatives and the least risk to restoration reaches, posing fewer risks to special status fish and aquatic invertebrate species from wildland fire of all action alternatives. This alternative would have the least amount of livestock grazing and the least potential for a decline in restoration reaches due to livestock grazing, transportation and travel, land use authorizations, and minerals exploration and development. Alternative V would have the fewest miles of perennial stream but the same miles of restoration reaches under Special Recreation Management Areas management as Alternatives II and III. Of all alternatives, Alternative V would have the most miles of perennial stream and restoration reaches that would improve due to ACEC designation.

Overall, Alternative V would result in major beneficial impacts to habitat conditions for special status fish and aquatic invertebrate species.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would have less risk of reducing PFC and HC ratings than the No Action Alternative and Alternatives I, II, and III, but more than Alternative IV and V. The riparian and wetland objectives are the same as Alternatives III, IV, and V. Active restoration is more likely to achieve the riparian and wetland objectives in a shorter timeframe than passive restoration.

Alternative VI would have more miles of perennial stream in critical suppression areas than Alternatives II and III but less than for the other alternatives. Less authorized grazing would occur than Alternatives II and III but more than the other alternatives. Areas available for livestock grazing would include 100 miles of perennial streams. The risk for impacts to riparian and habitat conditions in streams containing special status fish and aquatic invertebrate species due to livestock grazing would be more than for Alternatives I, IV, and V and less than for the other alternatives. Along with Alternatives II and III, Alternative VI has the same miles of conservation and restoration reaches in areas with limited travel designations, which is the most of all alternatives. There would be a minimal reduction in route density for this alternative. Alternative VI would have the same miles of conservation and restoration reaches in expected oil and gas areas as Alternative I, which is less than Alternative II but more than the other alternatives. Alternative VI would have more miles of special status fish and aquatic invertebrate species habitat in an ACEC than Alternative II, but less than the other alternatives.

Overall, Alternative VI would result in moderate beneficial impacts to habitat conditions for special status fish and aquatic invertebrate species.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

This cumulative impacts analysis considers the effects of past, present, and reasonably foreseeable management actions on Federal, State and private lands in and adjacent to the planning area in addition to the management actions to maintain or improve riparian conditions (proper functioning condition [PFC] ratings) and habitat conditions (habitat condition [HC] ratings). Management actions in the planning area would influence portions of the following three primary watersheds: Bruneau River, Salmon Falls Creek, and Snake River. These primary watersheds include lands administered by the BLM Bruneau, Burley, Shoshone, and Wells (NV) Field Offices; Humboldt-Toiyabe National Forest; Hagerman Fossil Beds

National Monument; and State lands. These watersheds also include private inholdings and two military withdrawal areas. Management actions and activities in the identified watersheds that have influenced riparian and habitat conditions in the past and have the potential to influence riparian and habitat conditions in the future were considered in this cumulative impacts analysis.

Past, present, and reasonably foreseeable actions for the following resources and resource uses cumulatively affect special status fish and aquatic invertebrates:

- Water Resources,
- Riparian Areas and Wetlands,
- Noxious Weeds and Invasive Plants,
- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Recreation,
- Transportation and Travel,
- Land Use Authorizations, and
- Minerals.

These actions are described in the *Introduction* to this chapter.

special status fish and aquatic invertebrate species are directly influenced by the condition of the riparian areas and the quality and quantity of water in the streams they occupy. Actions that reduce riparian conditions and water quality also have a negative impact on special status fish and aquatic invertebrate species. For this reason, the actions and activities identified in the cumulative impacts sections for Water Resources and Riparian Areas and Wetlands would also have cumulative impacts to special status fish and aquatic invertebrate species. Actions would be implemented on BLM-managed land to improve riparian conditions and water quality for special status fish and aquatic invertebrate species, but actions on State and private land may continue to affect PFC and HC ratings, water quality, and water quantity on BLM-managed land. As human population increase over time, the demand for surface water that supports riparian areas occupied by special status fish and aquatic invertebrate species is expected to increase.

The cumulative impacts assessment for special status fish and aquatic invertebrate species used the same process identified in the *Water Resources* and *Riparian Areas and Wetlands* sections to determine the condition of the watersheds with the potential to influence riparian areas containing special status fish and aquatic invertebrate species within the planning area. Geographic information system data were not available to assist in quantifying the type and amount of activities on private and State lands within the three primary watersheds. The geographic information system generated cumulative impact acres from Federal, State and private land due to wildland fire and transportation and travel.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Management actions implemented under the No Action Alternative, combined with actions on Federal, State, and private lands, have contributed to the current habitat conditions for special status fish, aquatic invertebrates, and native non-game fish. The No Action Alternative would reduce the likelihood for 34 miles of restoration reaches and 140 miles of Priority 1 and 2 reaches to improve over the life of the plan. Some of this impaired condition is due to dewatering of streams from Federal, State, and private lands for private and public land uses under legal water rights granted by the States of Idaho and Nevada.

The occurrence and frequency of large wildland fires and wildland fire suppression activities has increased on Federal, State, and private land in and adjacent to the planning area, partially as a result of the increase in noxious weeds and invasive plants and areas open to cross-country motorized vehicle use. Trails, primitive roads, and infrastructure from commodity uses such as livestock grazing, energy development activities, or minerals exploration or development, are expected to result in a cumulative increase in impacts to proper functioning condition (PFC) and habitat condition (HC) ratings for streams containing special status fish and aquatic invertebrate species. When combined with ongoing Federal,

State, and private land activities in and adjacent to the planning area, the management actions in the No Action Alternative would rank first in risk for cumulative impacts to PFC and HC ratings.

The No Action Alternative would maintain current habitat conditions for special status fish and aquatic invertebrate species, but does not provide specific direction for improving habitat conditions.

Cumulative Impacts from All Action Alternatives

All management actions implemented in the action alternatives would use the goals, objectives, and management actions for water resources, riparian areas and wetlands, fish, and special status species and the restoration direction in the Aquatic and Riparian Management Strategy (ARMS; Appendix D) to maintain or improve special status fish and aquatic invertebrate species habitats, comply with the Clean Water Act, and comply with Endangered Species Act requirements for riparian areas containing special status fish and aquatic invertebrate species.

Cumulative Impacts from Alternative I

The occurrence and frequency of large wildland fires and wildland fire suppression activities has increased on Federal, State, and private land in and adjacent to the planning area, partially as a result of the increase in noxious weeds and invasive plants and areas open to cross-country motorized vehicle use. Trails, primitive roads, and infrastructure from commodity uses such as livestock grazing, rights-of-way (ROWs) for energy developments, or minerals exploration or development are expected to result in a cumulative increase in impacts to PFC and HC ratings for streams containing special status fish and aquatic invertebrate species. The cumulative impacts from implementing the restoration direction in the ARMS is expected to improve riparian and habitat conditions more than the No Action Alternative and Alternatives II and III, but less than the other alternatives. When combined with ongoing Federal, State, and private land activities in and adjacent to the planning area, the management actions in Alternative I would rank fourth in risk for cumulative impacts to PFC and HC ratings.

Cumulative Impacts from Alternative II

The occurrence and frequency of large wildland fires and wildland fire suppression activities has increased on Federal, State, and private land in and adjacent to the planning area. Alternative II would include fuels treatments using prescribed fire and targeted grazing in addition to a substantial increase in permitted livestock grazing, concurrent with resource uses in planning area and on adjacent Federal, State, and private lands. Increased authorization for areas available for oil and gas leasing, wind energy development, geothermal leasing, existing and new range infrastructure, existing and new water developments, and ROWs would also be expected to contribute to an incremental increase in impacts to PFC and HC ratings. Similar uses on the adjacent federal, State and private lands would also be expected to have additional impacts to riparian areas containing special status fish and aquatic invertebrate species on public lands.

Implementing the ARMS direction would moderate impacts to PFC and HC ratings from authorized public land uses, but the direction would not moderate impacts from similar actions on Federal, State, or private land in or adjacent to the planning area. The cumulative impacts from the restoration direction in the ARMS is expected to result in more improvement in riparian and habitat conditions than the No Action Alternative but less than the other alternatives. When combined with ongoing Federal, State, and private land activities in and adjacent to the planning area, the management actions in Alternative II would rank second in risk for cumulative impacts to PFC and HC ratings.

Cumulative Impacts from Alternative III

Management strategies most beneficial for enhancing wildland fire suppression capabilities, management of fuels and reducing wildland fire would be emphasized and would occur concurrently with commodity uses such as livestock grazing, recreation, transportation and travel, land use authorizations, energy development, and minerals exploration. The potential increase in animal unit months (AUMs) for livestock grazing once upland vegetation objectives are achieved may impact a larger percentage of riparian areas in the planning area than all other alternatives, except Alternative II.

The construction of new roads would result in an a cumulative increase in roads in addition to existing roads currently used for other public land uses and the existing roads on Federal, State, and private land. Fire response time would be shortened as a result of these additional roads and fewer miles of riparian area would be impacted by wildland fire. These additional roads, particularly in Riparian Conservation Areas (RCAs), are expected to increase uses by public land users and contribute to a cumulative increase in the spread of noxious weeds and invasive plants and human-caused fires over the long term. There would be fewer acres of noxious weeds treated in Alternative III than all other alternatives which would result in a cumulative increase in the spread of noxious weeds and invasive plants between the Federal, State and private land. Increases in route density on Federal, State, and private lands in and adjacent to the planning area are expected which would result in additional cumulative impacts to special status fish and aquatic invertebrate species. New water developments created to enhance wildland fire suppression would occur simultaneously with the private land irrigation and livestock watering developments and would increase water demand on existing surface and groundwater resources. These increased water demands would primarily occur in Vegetation Management Area (VMA) B where water resources are already limited.

The restoration direction in the ARMS would moderate impacts to riparian and habitat conditions from authorized public land uses, but the direction would not moderate impacts from similar actions on Federal, State, or private land in or adjacent to the planning area. The cumulative impacts from implementing the restoration direction in the ARMS are expected to result in more improvement in riparian and habitat conditions than the No Action Alternative and Alternative II, similar amounts as Alternative VI, but less than Alternatives IV and V because of the overall increased wildland fire infrastructure and land uses in Alternative III. When combined with ongoing Federal, State, and private land activities in and adjacent to the planning area, the management actions in Alternative III would rank third in risk for cumulative impacts to PFC and HC ratings.

Cumulative Impacts from Alternative IV

Alternative IV has fewer authorized public land uses and more active restoration of instream and riparian areas than the No Action Alternative and Alternatives I, II, and III, which would result in the least risk for cumulative impacts to special status fish and aquatic invertebrate species and their habitats of all alternatives. Larger critical suppression areas would result in fewer cumulative impacts to riparian and habitat conditions for streams containing special status fish and aquatic invertebrate species from wildland fire and a reduced potential for wildland fire to spread onto adjacent Federal, State, and private lands. Fire suppression priorities would include the second most special status fish and aquatic invertebrate species habitat of all alternatives. Alternative IV has the most weed treatments of all alternatives and would pose the least risk for a cumulative increase in the spread of noxious weeds and invasive plants between the Federal, State, and private land.

The restoration direction in the ARMS would moderate impacts to riparian and habitat conditions from authorized public land uses, but the direction would not moderate impacts from similar actions on Federal, State or private land in or adjacent to the planning area. The cumulative impacts from implementing the ARMS is expected to result in more improvement in riparian and habitat conditions than the No Action Alternative and Alternatives I, II, III, and VI, but less than Alternative V. When combined with ongoing Federal, State, and private land activities in and adjacent to the planning area, the management actions in Alternative IV would rank sixth in risk for cumulative impacts to PFC and HC ratings.

Cumulative Impacts from Alternative V

Alternative V relies on passive restoration improvements in riparian and habitat conditions with limited active restoration. This alternative would have least amount of public land uses of all alternatives and the fewest cumulative effects to special status fish and aquatic invertebrate species habitats of all alternatives. Large contiguous Areas of Critical Environmental Concern adjacent to the Wilderness Study Area, Wild and Scenic Rivers, lands managed for wilderness characteristics, and the Bruneau –Jarbidge Rivers Wilderness would decrease the potential for cumulative impacts to riparian areas on public land which are occupied by special status fish and aquatic invertebrate species. Alternative V includes no additional wildland fire-related infrastructure and the least amount of authorized grazing of all alternatives.

This is expected to result in fewer cumulative effects to special status fish and aquatic invertebrate species habitat from livestock grazing on the BLM-managed land than in any other alternative. Grazing impacts may substantially increase on Federal, State and private land and result in cumulative effects to riparian conditions on BLM-managed land. The risk for wildland fire would likely be the greatest for this alterative, as there would be a greater amount of fine fuels and the least amount of wildland fire suppression infrastructure of all alternatives. The passive restoration would result in fewer cumulative impacts to special status fish and aquatic invertebrate species and longer recovery timeframes for PFC and HC ratings than for Alternative IV.

The restoration direction in the ARMS would moderate impacts to riparian and habitat conditions from authorized public land uses, but would not moderate impacts from similar actions on Federal, State, or private land in or adjacent to the planning area. The cumulative impacts from implementing the ARMS in Alternative V are expected to result in more improvement in riparian and habitat conditions which would result in the most improvement in special status fish and aquatic invertebrate species habitat of all alternatives. When combined with ongoing Federal, State, and private land activities in and adjacent to the planning area, Alternative V would have the least risk for cumulative impacts to PFC and HC ratings.

Cumulative Impacts from Alternative VI (Proposed RMP)

Similar to Alternative III, management strategies most beneficial for enhancing wildland fire suppression capabilities, managing fuels, and reducing wildland fire would be emphasized and would occur concurrently with uses such as livestock grazing, recreation, transportation and travel, land use authorizations, energy development, and minerals exploration. The potential increase in AUMs once upland vegetation objectives are achieved may impact additional riparian areas in the planning area. Alternative VI would have the same perennial stream miles available to livestock grazing as Alternative I with more authorized AUMs than the No Action Alternative and Alternatives I, IV, and V, but less than Alternatives II and III.

Cumulative impacts related to wildland fire suppression and increased suppression infrastructure for Alternative VI would be similar to Alternative III. New roads to enhance wildland fire suppression would result in an a cumulative increase in roads in addition to existing roads currently used for other public land uses and the existing roads on Federal, State and private land. Fire response time would be shortened as a result of these additional actions and fewer miles of riparian area and wetland would be affected by wildland fire. These additional roads, particularly of the roads in RCAs, are expected to have an increase in uses by other public land users and contribute to a cumulative increase in the spread of noxious weeds and invasive plants and human-caused fires over the long term. There would be fewer acres of noxious weeds treated in Alternative VI; similar to Alternative III but less than the other alternatives which would result in a cumulative increase in noxious weeds and invasive plants in RCAs containing special status fish and aquatic invertebrate species. Increases in route density on Federal, State, and private lands in the analysis area are expected to result in additional cumulative impacts to RCAs. New water developments created to enhance wildland fire suppression would occur simultaneously with the private land irrigation and livestock watering developments and would increase water demand on existing surface and groundwater resources. These increased water demands would primarily occur in VMA B where water resources are already limited.

The restoration direction in the ARMS would moderate impacts to riparian and habitat conditions from authorized public land uses, but would not moderate impacts from similar actions on Federal, State, or private land in or adjacent to the planning area. The cumulative impacts from implementing the restoration direction in the ARMS are expected to result in more improvement in riparian and habitat conditions than the No Action Alternative and Alternatives I, II, and III, but less than Alternatives IV and V. When combined with ongoing Federal, State, and private land activities in and adjacent to the planning area, the management actions in Alternative VI would rank fifth in risk for cumulative impacts to PFC and HC ratings.

4.3.7.3. Special Status Wildlife

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to special status wildlife habitat:

- **Change in upland acres of habitat for wildlife groups** – This indicator was selected to help quantify relative changes to wildlife group habitat based on vegetation treatments between the alternatives. This indicator allows for the comparison of type and general location (Vegetation Management Area) priority of vegetation treatments between alternatives.
- **Miles of riparian areas meeting or planned to be restored and managed to achieve proper functioning condition** – This indicator is used to compare the amount of riparian area at proper functioning condition (PFC) and riparian restoration between the alternatives. The more miles of riparian areas at PFC, the better the habitat is for the riparian group wildlife.
- **Acres with special management emphasis** – This indicator provides a mechanism to compare acreage between alternatives of areas with management emphasis. Management emphasis would increase (e.g. areas managed for motorized recreation) or decrease (e.g. exclusion areas or avoidance areas managed with seasonal restrictions, exclusion areas, etc.) disturbance or infrastructure to special status wildlife or their habitat. Human disturbance would increase with additional infrastructure due to construction and maintenance. Infrastructure can contribute to habitat fragmentation (Connelly et al., 2004; Ingelfinger and Anderson, 2004; Johnson, et al., 2011; Sawyer et al., 2007) and mortality (Arnett et al., 2007; Barclay et al., 2007; Stevens et al., 2011).
- **Relative change in the amount of herbaceous cover for wildlife** – This indicator compares relative amounts of herbaceous cover (height and density) available to wildlife for nesting, thermal, or security cover among alternatives. Vegetative cover has been linked to sage-grouse habitat use and nest success (Connelly et al., 2004; Connelly et al., 2000; Gregg et al., 1994; Holloran et al., 2005). Forbs are an important component of female sage-grouse diets prior to nesting (Gregg et al., 2008) and of chick diets (Drut et al., 1994b; Huwer et al., 2008) following hatching.
- **Change in distribution or numbers of special status wildlife** – This indicator compares the distribution of wildlife in the planning area. Increases or decreases in habitat may alter the distribution of special status wildlife. For example, large wildland fires that eliminate shrubs would generally preclude or reduce use by Brewer's sparrow or sage sparrow from nesting in the area until shrubs re-established and met the habitat needs for these species.

Methods and Assumptions

Impacts to special status wildlife from management in the following sections of Chapter 2 were analyzed in detail: *Special Status Species*, *Vegetation Communities* (including *Upland Vegetation* and *Riparian Areas and Wetlands*), *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations*, *Minerals*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for special status wildlife. Impacts from management for special status wildlife can be found under *Impacts from Special Status Species Actions* in the *Special Status Plants, Livestock Grazing, Transportation and Travel, and Land Use Authorizations* sections.

To the extent practical, geographic information system data layers were used to calculate restoration acreage in Areas of Critical Environmental Concern (ACECs), critical wildland fire suppression, acreage of habitat in utility rights-of-way corridors, open or closed areas, etc. Geographic information system data was used to establish baseline data for current vegetation and types of infrastructure on Federal land. In some instances, the analyses were quantitative comparisons (e.g., acres of sagebrush steppe habitat in a particular ACEC by alternative). However, other comparisons (e.g., relative amount of new infrastructure) were qualitative because specific projects are not known nor spatially identified. Inherent in the analyses

are inaccuracies that may be present in the geographic information system data. These errors from a planning area scale should be negligible.

Change in acres of upland habitat for wildlife groups were analyzed based primarily on changes of acres of type of restoration or vegetation treatments. To the extent possible the analysis was quantitative and based primarily on the vegetation section. Assumptions for this analysis include the following:

- Increases in habitat for sagebrush steppe, mountain mahogany/mountain shrub would benefit wildlife species in those habitat groups. Conversely, increases in habitat for wildlife in the sagebrush steppe or mountain mahogany/mountain shrub groups would decrease habitat for grassland group species as shrub cover and height increases and more closely resembles sagebrush steppe (McAdoo et al., 1989).
- Wildlife species like sage-grouse which use large blocks of contiguous habitat, small islands of habitat are functionally smaller than their physical size (Shepherd, 2007).
- Dominant late-successional grasses in the planning area typically recover to pre-treatment density and production within five years (Wright et al., 1979).
- Canyonland habitats are influenced by topography and geology as well as vegetation.
- Aspen stands are site-limited in the planning area and are predominantly influenced by soils and moisture.
- Restored areas (e.g., seeded or planted to shrubs or trees) would typically take more than 15 years for the shrub or tree component to attain the structure (height, diameter, density and/or canopy cover) to function like intact mature habitat within a group community. Restored habitats which take longer to become mature include sagebrush steppe (Baker, 2006; Connelly et al., 2004; Howard, 1999; Steinberg, 2002; Wright et al., 1979), mountain mahogany/mountain shrub (Gucker, 2006; Johnson, 2000), and aspen (Dobkin et al., 1998; Howard, 1996).
- Sage-grouse are an umbrella or indicator species for other sagebrush-obligate special status wildlife including pygmy rabbit, Brewer's sparrow, sage-sparrow (Rowland et al., 2006;, Wisdom et al., 2000), and loggerhead shrike.

Riparian areas to be restored and managed to achieve PFC were analyzed based primarily on the number of miles in perennial riparian areas, or miles of riparian area which had attained PFC and additional miles targeted to achieve PFC. Assumptions for this analysis include the following:

- Riparian areas which have achieved PFC provide quality habitat for special status wildlife in the riparian group compared to riparian areas which have not achieved PFC. Riparian area function relates to vegetation composition and height, stream bank stability, channel morphology within the land form, and water table depth.
- Attainment of PFC is minimum needed for proper riparian function. This minimum is not the same as late-successional riparian communities. It takes longer for trees and shrubs to attain full size (Dobkin et al., 1998; Schulz and Leininger, 1991) than herbaceous vegetation. Willows, aspen, and other woody species provide the structure needed by willow flycatchers and other special status riparian wildlife for nesting and foraging.
- Beaver ponds, oxbows, and cut-off channels provide Columbia spotted frog (hereafter spotted frog) habitat for reproduction, foraging, and hibernation (Munger and Oelrich, 2006). Water storage reservoirs, canals, troughs and stock ponds are also used by some special status wildlife as water sources.

Acres with special management were quantitatively and qualitatively analyzed based on availability (such as open, closed, available with constraints, etc.) or management focus (such as reducing restoration, reducing route density, primitive recreation, critical suppression areas, etc.) of an area. Assumptions in this analysis were:

- Areas closed or excluded to uses or activity would not be impacted by that activity, whereas areas open or available would likely be affected by the activity.

- Areas open or available for a resource use would encourage additional use and infrastructure. If a discrete acreage was projected for use (gravel pits, reasonably foreseeable development scenarios, etc.), this impact analysis looked at the reduced area rather than the entire open or available area.
- Special management may increase or decrease impacts to special status wildlife.
- Roads reduce and divide habitat (Forman and Alexander, 1998; Sawyer et al., 2007) and are a source of wildlife mortality (Connelly et al., 2004; Jochimsen, 2006). Wildlife killed on roads augment food for scavengers and scavenging predators. Brewer's sparrows and sage sparrows nest at lower densities near maintained roads including graveled low-use roads (Gilbert and Chalfound, 2011; Ingelfinger and Anderson, 2004) compared to similar habitat without roads. Other birds such as horned lark are attracted to the open or edge areas and compete with shrubland birds (Ingelfinger and Anderson, 2004). Impacts of jeep trails or two tracks on wildlife use of habitat have not been studied in sagebrush systems.
- Power poles and communication towers provide raptors and ravens additional perching or nesting sites (Steenhof et al., 1993), may alter habitat use by some wildlife, or increase predation locally at some distance from the structure (Armentrout and Hall, 2006). Fences and corrals also provide short perch sites for these species.
- Infrastructure with wires is a source of collision mortality to wildlife. (Beck and Mitchell, 2000; Connelly et al., 2004; Harrington and Conover, 2006; Rowland et al., 2000; Steenhof et al., 1993; Stevens et al., 2012).
- Human disturbance or occupancy increases displacement of wildlife and temporal or spatial habitat fragmentation or abandonment. Increased human presence for access, recreation (Cassirer et al., 1992; Miller et al., 1998, 2001) or during maintenance can displace wildlife. Conversely some wildlife are attracted to areas of human disturbance particularly when limited habitat component (food, water, etc.) is created or augmented (Blakesley and Reese, 1988; Webb et al., 2009). Some special status wildlife species respond to disturbances more readily than other special status wildlife species. Individuals within a species may react differently to the same disturbance.
- Infrastructure influences an area substantially larger than the actual ground disturbance or project footprint (Arnett et al., 2007; Doherty et al., 2008; Holloran et al., 2005; Ingelfinger and Anderson, 2004; Leu et al., 2008; Leu and Hanser, 2011; Walker et al., 2007a, 2007b).
- Restoring upland special status wildlife habitat would take more than 15 years to simulate mature sagebrush steppe, mountain mahogany/mountain shrub or aspen habitats.
- Special management may increase or decrease impacts to special status wildlife.

Relative change in the amount of herbaceous cover and forage for wildlife was qualitatively analyzed based on the percent of vegetation remaining following use at specific levels. The assumption in this analysis was:

- Current year and residual herbaceous vegetation from previous years (composition, height, and cover) influences wildlife use of habitat (Barnett and Crawford, 1994; Connelly et al., 2000; Connelly et al., 2004; DeLong et al., 1995; Drut et al., 1994a; Gregg et al., 1994; Gregg et al., 2008; Huwar et al., 2008).

Change in the distribution of special status wildlife was qualitatively analyzed because BLM vegetation treatments would alter the composition and structure of the treated area. In the future, the BLM could participate in special status species recovery efforts such as transplants or re-introductions. Restoration, transplants, or re-introductions would require a project specific analysis. Assumptions in this analysis were:

- Restoration or other changes in habitat would result in localized or larger area shifts in habitat available for special status species and influence their distribution.
- Transplants or re-introductions would reduce the chance of a small isolated population becoming extirpated by a single event and help maintain or improve the gene pool.
- Proactive transplants or re-introductions may prevent the listing of species with limited distributions.
- Several transplant efforts and years would likely be needed before the target species was a self-sustaining local population.

It must be noted special status species distribution or numbers can change due to factors (e.g. disease [West Nile virus], weather, or wildland fire) not related to habitat or management.

Direct and Indirect Impacts

Impacts from Special Status Species Actions

The following indicators were used to analyze impacts from Special Status Species Actions to special status wildlife species:

- Change in upland acres of habitat for wildlife groups,
- Acres with special management emphasis, and
- Change in distribution or numbers of special status wildlife.

Impacts from Management Specific to the No Action Alternative

General direction in the 1987 RMP stated "Priority for habitat management will be given to habitat for listed and candidate Threatened, Endangered and Sensitive species." This general direction would allow for the restoration of special status species habitat including: Bruneau Dunes tiger beetle, spotted frog and western toad, and sage-grouse and other sagebrush steppe special status wildlife species. Restoration of sagebrush steppe, mountain mahogany/mountain or riparian would increase these group habitats in the long term, and potentially the distribution or numbers of specific special status wildlife associated with restored habitat.

The No Action Alternative provides direction for California bighorn sheep (bighorn sheep), sage-grouse, sharp-tailed grouse, prairie falcon, ferruginous hawk, and a few other species. The 1987 RMP addressed no occupancy time periods and distances for oil and gas development for ferruginous hawks, prairie falcons, mountain quail, sage-grouse, sharp-tailed grouse, and bighorn sheep in order to help reduce human disturbance and displacement of some special status wildlife during project construction. These restrictions reduce human disturbance during project construction, but not during operation or maintenance. Depending on the project some special status wildlife would probably be displaced.

Direction specific for bighorn sheep prohibited development of livestock waters within one mile of bighorn sheep habitat to help insure a separation between livestock and maintain low levels human disturbance. This special management extended past the Bruneau and Jarbidge River Canyons into the uplands. Approximately 97% of bighorn sheep locations are within one mile of the canyon rims. The RMP prohibited converting cattle animal unit months (AUMs) to domestic sheep AUMs in allotments adjacent to bighorn sheep habitat unless a satisfactory separation could be maintained by fences or topography. Fences built to BLM standards would not necessarily insure a separation between domestic sheep and bighorn sheep. Allowing domestic sheep grazing adjoining occupied bighorn sheep habitat increases the risk of bighorn sheep during normal movements contracting disease from domestic sheep. Bighorn sheep populations frequently decline after being exposed to apparently healthy domestic sheep. *Mycoplasma ovipneumoniae* found in domestic sheep (Besser et al., 2012) predisposes bighorn sheep to disease from other bacterial diseases including *Mannheimia haemolytica* (Dassanayake et al., 2010). *Mannheimia haemolytica* transferred from domestic sheep can cause bighorn sheep mortality (Lawrence et al., 2010). A pneumonia epidemic would substantially reduce the current bighorn sheep population in the planning area. Continued high lamb mortality due to recurrent chronic pneumonia would likely limit future population recovery for several (more than seven) years (Cassirer and Sinclair, 2007; George et al., 2008).

Transplants or re-introductions of special status wildlife within the planning area were not addressed in the 1987 RMP. Because transplants or re-introductions could be allowed, special status species numbers and distribution could increase locally in the short term if species are transplanted or re-introduced. The establishment of a self-sustaining population would maintain the distribution of the transplanted species long term at the local scale and in suitable habitat at the planning area scale.

The No Action Alternative provides the least amount of direction for restoration of specials status species habitat. The No Action Alternative provides the least direction for special status wildlife. The majority of

direction was limited to oil and gas development. Overall impacts would be adverse and minor to moderate at the local scale.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The Conservation Agreement and Strategy for Columbia Spotted Frog (*Rana luteiventris*) contains some provisions for habitat restoration (CSFTT, 2003). Restoration of spotted frog habitat may increase distribution of the species at the local scale in the long term. The change in distribution at the local scale would be minor to moderate increase. Some conservation actions or measures in the Candidate Conservation Agreement for Slickspot peppergrass, such as increasing sagebrush and forbs, for slickspot peppergrass would improve habitat for sage-grouse, sage sparrow, pygmy rabbit, loggerhead shrike, and Brewer's sparrow in the long term at the local scale. The change in distribution would be a minor increase Brewer's sparrow and other species locally in the long term. At the planning area scale the restoring slickspot peppergrass would have a minor negligible increase in the general distribution of sage sparrow, Brewer's sparrow, or sage-grouse in the long term. Changes to the distribution from improved riparian habitat or sagebrush steppe would be minor to negligible at the planning area scale. Continued following of the spotted frog conservation strategy would have a minor beneficial impact at the local scale, but would be negligible but beneficial in the long term for the Great Basin subpopulation.

Impacts from Management Specific to Alternative I

Management actions provide direction to protect and restore habitat for special status species for any habitat group. For example, habitat for largely unknown sensitive species like Bruneau Dunes tiger beetle could be restored. Restoration of special status wildlife habitat would be influenced primarily by actions in the *Wildland Fire Ecology and Management* and *Vegetation Communities* sections.

Alternative I provides for the potential transplant or re-introduction of special status wildlife. Following habitat evaluation and site specific environmental analysis, this management action would allow the BLM, in cooperation with partners, to relocate special status wildlife. Release areas would include sites with suitable habitat where they had been found historically or new areas with suitable habitat. Re-introductions of listed species would likely result in seasonal or habitat management restrictions within the introduction area unless the transplanted species were categorized as experimental population. The amount and type of restrictions would depend on special status wildlife species transplanted and its habitat(s). Sensitive species with narrow distributions or specific habitats would likely result in localized management changes. For example, special management following restoring habitat and re-introducing Bruneau dunes tiger beetle would impact small areas (individual pastures) with suitable duneland habitat. Conversely re-introducing peregrine falcon would potentially influence a larger area (several allotments) due to its larger home range and mobility. Transplanting special status wildlife that are not listed as threatened or endangered could prevent future listing of the transplanted species. For example, restoring habitat and transplanting spotted frogs would more likely reduce the need for listing than re-introducing a wide ranging species like Brewer's sparrows. Transplanting would maintain or increase distribution of the target special status species at the local level in the short term. Once the species became established the distribution would be maintained long term.

Alternative I contains direction to minimize the transmission of disease between domestic sheep or goats and bighorn sheep by not converting cattle AUMs to domestic sheep or goats within the nine mile separation distance, not trailing sheep or goats within the nine mile separation distance, and requiring a herder be present during trailing of domestic sheep or goats. Based on the available data bighorn sheep are not known to make long forays from the Bruneau-Jarbidge Canyons north or east into allotments grazed by domestic sheep. The nine mile separation distance would reduce the risk for the transmitting disease between bighorn sheep and domestic sheep or goats, minimizing the chance of rapid bighorn sheep population declines.

Alternative I provides for a larger buffer distance (9 miles) be maintained between domestic sheep and bighorn sheep than the No Action Alternative or Alternative II. Buffer distance for nesting special status raptors is similar. The nine mile buffer is the same as Alternatives III, IV, V, and VI. Overall, Alternative I would have a local minor to moderate beneficial impact on special status species.

Impacts from Management Specific to Alternative II

In Alternative II, special status wildlife classified as Endangered, Threatened, Proposed, or Candidate (Type 1 BLM Sensitive species) would be the primary focus of habitat management. At present, this includes the greater sage-grouse, spotted frog, and yellow-billed cuckoo, which are Candidate species. In Alternative II, restoration of habitat for other Idaho BLM Sensitive wildlife species (Types 2 and 3) would be a low priority. Alternative II would maintain or increase habitat for sage-grouse by restoring native grassland to native shrubland and introducing forbs and late-successional grasses to native shrublands. Restoring sagebrush to native grasslands would increase habitat for sage-grouse at the local scale in the long term. However, part of the restoration would be due to natural recovery. Natural recovery would slow sagebrush establishment, particularly areas where the seed source has been depleted by multiple wildland fires. Additionally sagebrush would be actively removed in some vegetation communities to maintain grassland.

Alternative II would allow for the re-introduction or transplanting of special status wildlife that are either candidates or listed under the Endangered Species Act. Transplants of Type 1 special status wildlife would increase the distribution of the transplanted species. Re-introductions of listed species would likely result in additional seasonal or habitat management restrictions within the introduction area unless the transplanted species were categorized as experimental population. The amount and type of restriction would depend on species transplanted. Local endemic or species with limited distributions would not proactively be transplanted, potentially increasing the risk of future listing. The species distribution for local special status wildlife endemics would remain unchanged or decline. Impacts of re-introduced listed or candidate species would be a minor to moderate increase in distribution at the local scale in the long term.

This alternative contains no prohibitions regarding changing the class of livestock from cattle to domestic sheep or goats adjoining bighorn sheep habitat in the Bruneau and Jarbidge Canyons. Alternative II provides no direction for the trailing of domestic sheep or goats near bighorn sheep habitat. The lack of direction increases the potential for disease transmission from domestic sheep to bighorn sheep. A pneumonia epidemic would substantially reduce the current bighorn sheep population and possibly distribution in the planning area in the short term. Continued high lamb mortality from pneumonia pathogens carried by adult bighorn sheep would likely limit population recovery similar to a study in Colorado (George et al., 2008) in the long term.

Alternative II provides the second least amount of restoration and direction for special status species. Buffer distances for nesting special status species raptors and bighorn sheep would be least. Emphasis for management would be given primarily to federally listed, proposed or candidate species. Alternative II is tied with Alternative III for the least management emphasis for bighorn sheep habitat. Alternative II would have a localized minor beneficial impact on special status species which are categorized listed, proposed or candidate species.

Impacts from Management Specific to Alternative III

Implementing Alternative III would have more restoration of Type 1 special status wildlife species habitat than the No Action Alternative and Alternative II. At the local scale, increases in habitat would be minor to moderate for the distribution for sensitive species. At the planning area scale increases in habitat would be minor in the long term.

Transplants or re-introductions would be authorized only for listed or candidate special status wildlife the same as Alternative II and impacts would be the same.

Converting the class of livestock from cattle to domestic sheep or goats and trailing of domestic sheep would be consistent with national policy. Beneficial impacts would be similar to Alternative II.

Impacts from Management Specific to Alternative IV

Similar to Alternative I special status wildlife habitat would be a priority for restoration. Impacts of increasing special status wildlife habitat would be similar to Alternative I.

Proactively re-introducing special status wildlife species in suitable habitat would likely prevent the future listing of narrow endemic species and in some instances special status species with a wider distribution. Transplanting special status wildlife would result in a minor to moderate increase in the species distribution at the local scale in the short and long term.

The bighorn sheep population would be less likely to rapidly decline and lamb recruitment would not be impaired by disease from domestic sheep or goats, because a nine mile separation distance between bighorn sheep habitat and domestic sheep allotments. Like Alternatives I, V, and VI, the nine mile separation would apply to the trailing of domestic sheep. Overall Alternative IV would have a minor to moderate benefit to special status wildlife at to the local and landscape scales.

Impacts from Management Specific to Alternative V

Impacts of Alternative V would be similar to Alternative III regarding sensitive species habitat being restored.

Transplanting special status wildlife would have the same effect as Alternative I.

Alternative V would minimize the potential for a rapid bighorn sheep population decline and change in distribution due to disease transmission from domestic sheep or goats to bighorn sheep by having a nine mile separation distance between bighorn sheep habitat and allotments grazed by domestic sheep or goats. Alternative V would have a negligible to moderate beneficial impact at the local and landscape scales in the short term. Alternative V would have a moderate benefit to special status wildlife at to the local scale and negligible to minor benefit at the landscape scale in the long term.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Impacts of Alternative VI would be similar but slightly higher in acres restored compared to Alternative III. However, Alternative VI relies more on natural recovery.

Like Alternative I the full array of special status wildlife species would be eligible for potential reestablishment if suitable habitat was present. Long-term impacts would be the same at the local and planning area scale.

Alternative VI would minimize the potential for disease transmission from domestic sheep or goats to bighorn by having a nine mile separation distance between bighorn sheep habitat and allotments grazed by domestic sheep or goats.

The Diamond A, Inside Desert, Devil Creek, and Browns Bench subdivisions (Map 25) from the Jarbidge Sage-grouse Conservation Plan (Jarbidge Sage-Grouse Local Working Group, 2007) were adopted for Alternative VI as the sage-grouse management area. General restoration areas identified by the local working group lie within the sage-grouse management area. This area contains nearly all the remaining sagebrush habitat. The sage-grouse management area encompasses approximately 988,000 acres or the southern 70% of the planning area. The sage-grouse management area contains 305,000 acres of sage-grouse key habitat, 90 occupied sage-grouse leks and 86 other sage-grouse leks. The sage-grouse management area overlaps habitats used by a number of other special status wildlife. Within the sage-grouse management area, guidance would be applied limiting some BLM authorizations as appropriate. Guidance would limit some types of BLM authorizations, some routine schedule maintenance or add time of day or seasonal restrictions for some activities. Fire suppression and habitat restoration would be emphasized within the management area. Fire suppression would help limit loss of sagebrush habitat. Restoration would establish, expand, or connect remaining sagebrush habitat.

This sage-grouse management area lies within Area F (Makela and Major, 2012) in the Western Association of Fish and Wildlife Agencies' Snake River Plain Sage-grouse Management Zone for southern Idaho and the portion of northern Nevada. The sage-grouse management area contains the vast majority of sagebrush steppe and all the mountain mahogany/mountain shrub and aspen habitats in the planning area.

Table 4-164. Selected Special Status Wildlife Habitat Components and Observations Within the Sage-grouse Management Area

Component/Observation	Amount
Sage-grouse leks (occupied)	90
Sage-grouse leks (other)	86
Sage-grouse leks (unoccupied)	21
Key sage-grouse habitat (acres)[A]	305,000
Sage-grouse restoration habitat (acres)[A]	623,000
Bighorn sheep habitat (acres)[A]	48,500
Sharp-tailed grouse leks (occupied)	2
Ferruginous hawk (nest sites)	52
Lewis's woodpecker (sites)	26
Prairie falcon (nest sites)	23
Northern goshawk (breeding season observations)	4
Pygmy rabbit (sites)	62
Spotted frog (streams)	5
Riparian/Perennial streams (miles)	252

[A] Acreage is current as of December 2011

Alternative VI would have a negligible to moderate benefit at the local scale in the short and long term. Alternative V would have a negligible to minor beneficial impact to special status wildlife in the long term.

Impacts from Vegetation Communities Actions

Vegetation structure, cover, and composition affect special status species abundance and distribution within broad community types. Habitat structure (shrub cover greater than 15%; shrub height 9 inches to over 25 inches; grass height 7 inches, grass cover (greater than 4.7%), and food forb abundance (3.1% to 5.6%) influence sage-grouse (Connelly et al., 2011b). Values vary some between geographic areas and habitat types. Pygmy rabbit habitat generally includes tall dense sagebrush and deep soils (Green and Flinders, 1980). In southeastern Idaho pygmy rabbit habitat consisted of shrub cover that was nearly 50% and shrub heights averaging greater than 27 inches (Heady and Laundré, 2005) whereas in Nevada shrub cover was 44% and shrub heights were greater than 38 inches (Larrucea and Brussard, 2008). Shrub cover exceeded 50% in pygmy rabbit habitat in southwestern Idaho and shrub height was 50% taller than unoccupied habitat (Burak, 2006). Changes in vegetation communities from one group habitat to another (e.g., native grassland to shrubland) may alter the associated special status wildlife by changing the plant community structure and plant species composition (McAdoo et al., 1989), habitat patch size, and distance between similar habitat patches (Knick and Rotenberry, 1995). Vegetation Management Area (VMA) priority and desired future condition, with respect to the amount of riparian, grassland, and shrubland, vary between alternatives (Table 4-165). Table 4-166 presents information regarding special status wildlife records as they occurred in each VMA.

Table 4-165. Vegetation Management Area Restoration Priority and Desired Future Condition for Grassland, Shrubland, and Riparian Plant Communities by Alternative

Category	Alternative						
	No Action	I	II	III	IV	V	VI
VMA Restoration Priority	NA	C & A	A & B	A & D	D & C	A & C	D & C
Grassland (acres)	998,000	630,000	977,000	738,000	376,000	520,000	493,000
Shrubland (acres)	325,000	694,000	347,000	566,000	948,000	804,000	830,000
Riparian (miles)	85	145	85	183	183	183	183

Table 4-166. Selected Special Status Wildlife Habitat Components and Observations by Vegetation Management Area

Component/Observation [A]	VMA A	VMA B	VMA C	VMA D
Sage-grouse leks (occupied)	0	35	36	20
Sage-grouse leks (other)	2	33	32	24
Sage-grouse leks (unoccupied)	0	13	12	1
Key sage-grouse habitat (acres)	2,000	133,000	80,000	97,000
Sage-grouse restoration habitat (acres)	19,000	414,000	221,000	86,000
Bighorn sheep habitat (acres)	0	27,000	13,000	9,000
Sharp-tailed grouse leks	0	0	2	0
Ferruginous hawk (nest sites)	7	29	17	8
Prairie falcon (nest sites)	3	14	6	5
Pygmy rabbit (sites)	1	28	12	24
Lewis's woodpecker (sites)	1	1	2	23
Spotted frog (streams)	0	0	0	5
Northern goshawk (breeding season observations)	0	0	0	4
Bald eagle (number of winter sites)	36	0	1	0
Bruneau Dunes tiger beetle (number of sites)	1	0	0	0

[A] All information is current as of December 2011.

Idaho Department of Fish and Game and Nevada Department of Wildlife use different terminology to classify sage-grouse leks. For the analysis, occupied sage-grouse leks are those that have had two males displaying within the last five years based on between year counts. Unoccupied leks are those which have not been attended by displaying male sage-grouse within the last five years based on multiple checks within and between years. Sage-grouse leks categorized as other are those which were observed only once or have not been consistently counted within the last five years.

The following indicators were used to analyze impacts from Vegetation Communities actions to special status wildlife species:

- Change in upland acres of habitat for wildlife group,
- Miles of riparian areas meeting or planned to be restored and managed to achieve proper functioning condition (PFC), and
- Change in distribution or numbers of special status wildlife.

Impacts from Management Specific to the No Action Alternative

The limited amount of habitat restoration in the sagebrush steppe and mountain mahogany/mountain shrub groups would likely result in the present amount of habitat for special status wildlife declining. In the long term, sage-grouse, sharp-tailed grouse, pygmy rabbit, Brewer's sparrows, sage sparrow, loggerhead shrike, and ferruginous hawk would somewhat decline because of wildland fire, limited scale of restoration efforts, and maintenance of large grasslands.

Although some habitat restoration would continue to occur, restored group habitat would not likely keep pace with wildland fires. Management of bighorn sheep habitat toward late-successional plant communities would remain a goal in the No Action Alternative. However, the trend toward increasing annual grassland would continue in bighorn sheep habitat due to wildland fires. The 1987 Jarbidge RMP did not address aspen management. However, there have been a few small projects to thin juniper invading some aspen stands to maintain aspen dominance.

Habitat management to move riparian areas to PFC would maintain or gradually improve habitat for spotted frog, northern leopard frog, western toad, and Woodhouse toad. Management to maintain or restore aspen, cottonwood, and willows in riparian areas would enhance habitat for willow flycatcher and to a lesser extent yellow-billed cuckoo.

In the short term, local distributions of sage-sparrow and Brewer's sparrow would decline due to decreasing shrubland. At the planning area scale, the change in distribution of sagebrush steppe special

status wildlife would be minor to moderate. Because there are no special status wildlife in the grassland group, increases in grassland are not expected to benefit habitat for any special status wildlife. Piute ground squirrel populations would likely fluctuate more due to increasing grassland habitat, particularly during drought (Steenhof et al., 2006; Van Horne et al., 1998). Distribution of bighorn sheep is expected to remain the same. The No Action Alternative is tied with Alternative II as last for riparian restoration and has the least upland habitat restoration of the alternatives.

Impacts from Management Specific to Alternative I

Restoration would also be used to create multiple “stepping stone” routes to reestablish connectivity between large blocks of habitat (Dramstad et al., 1996), which would facilitate pygmy rabbit movements between areas of suitable habitat. Special status species habitat in VMA C and A would be a high priorities for restoration to increase shrubland habitat. The objectives in VMA C and A would be to increase shrubland by 110,000 acres and 17,000 acres, respectively. Restoring 201,000 acres of shrubland in VMAs B and D would increase the amount of suitable for sagebrush steppe special status wildlife. Once habitat matures, active restoration in the uplands of VMA C would likely result in an increased distribution of sage-grouse in the southern part of the planning area over time due to increased quantity of shrub steppe habitat. Increased pygmy rabbit distribution would likely be delayed because of their use of areas with tall dense sagebrush. Brewer’s sparrow and sage sparrow would likely shift their distribution before other special status wildlife in sagebrush steppe, because of their ability to use sparser sagebrush cover. Restoration in VMA A would provide less benefit for a variety of special status wildlife compared to other VMAs (Table 4-165). At the local scale, changes in distribution would initially be negligible short term and moderate long term. At the planning area scale moderate increases in sagebrush steppe would benefit sage-grouse, pygmy rabbit, Brewer’s sparrow, sage sparrow, and loggerhead shrike in the long term.

Sagebrush steppe habitat restoration would enhance prey diversity (e.g., jackrabbits, ground squirrels, mountain cottontail, least chipmunk, sagebrush vole, etc.) used by prairie falcon (MacLaren et al., 1988; Steenhof et al., 1999) and ferruginous hawk (Bechard and Schmutz, 1995; MacLaren et al., 1988;). Piute ground squirrel populations fluctuate less in sagebrush steppe habitats compared to grasslands (Steenhof et al., 2006; Van Horne et al., 1998). Planting and establishing shrubs other than sagebrush (e.g., serviceberry, chokecherry) for wintering big game would improve habitat for wintering sharp-tailed grouse (Marks and Marks, 1988).

Restoration of bighorn sheep habitat in canyons would continue to be limited by access, topography, rocky soils, and treatment technology. Bighorn sheep habitat adjacent to canyons on the plateaus outside the wilderness boundary could be restored. Bighorn sheep distribution would likely not change appreciably because of their use of steep topography for escape and security cover. Distribution of special status wildlife in the aspen group (e.g., Lewis’s woodpecker or northern goshawk) would remain patchy due to the location of aspen stands with large diameter aspen trees used for nesting.

Aspen treatments would generally be limited to reducing conifer (juniper) encroachment (e.g., selective cutting) and management to promote the establishment of aspen sprouts in existing aspen stands. Juniper thinning would typically be done in the late spring or fall. In the long term, some aspen cutting, girdling, or burning treatments may be implemented to encourage sprouting in over-mature aspen stands. Populations of special status in the aspen group (e.g., Lewis’s woodpecker, northern goshawk, willow flycatcher) would be negligibly impacted by vegetation treatments because cutting or burning of entire aspen stands would be limited. For northern goshawk or Lewis’s woodpeckers, nest trees would be avoided in specific projects.

Vegetation treatments in VMA A that reduce future non-native annual invasions of duneland habitat would likely benefit tiger beetle. Tiger beetle habitat restoration would likely require treatments such as prescribed fire (Winton, 2010) and herbicide spraying (Bouffard et al., 2009) to reduce non-native annuals and improve tiger beetle habitat. Drill seeding dunes and dune interspaces to non-native perennial grass would reduce tiger beetle habitat.

Approximately 145 miles of riparian areas would achieve PFC in Alternative I. In riparian areas with a shrub component habitat would increase for willow flycatchers. Riparian habitat along the Snake River, which has sporadically been used by yellow-billed cuckoo, would be maintained. Fenced reference areas would increase the amount of protected riparian area. Natural recovery of the riparian areas within the reference areas would likely be faster than outside the reference areas because of increased protection. Restoration of willows in riparian areas would enhance habitat for willow flycatcher and Calliope hummingbird.

A full range of riparian restoration options would be available for use including installation of gabions, straw bales, or other structures; planting desired sedges and shrubs; fencing to limit livestock access; herding, etc. These methods would allow riparian areas to improve more rapidly than without focused management. Restoration of riparian habitat would also include transplanting beaver to specific drainages with suitable habitat (e.g. perennial water and woody vegetation) to create habitat components for spotted frogs (Amish, 2006) or other riparian group special status species. Beaver dams change stream hydrology, including increasing water storage (Hall et al., 2011; Naiman et al., 1988; Pollock et al., 2007). Dam building by transplanted beaver would help raise the water table in some creeks. Spotted frog habitat would be improved by increasing water permanence, creating slow water (Hall et al., 2011) for reproduction, open shallow water areas for basking, emergent vegetation for cover, and areas for hibernation (Munger and Oelrich, 2006; Watson et al., 2003).

Spotted frogs in Rocky Canyon would remain vulnerable to extirpation because they are generally isolated from other spotted frog populations within the upper Salmon Falls Creek drainage. Distances between spotted frog sites along riparian zones vary from 3 miles to over 29 miles. In southwestern Idaho, the vast majority of spotted frogs moved less than 0.1 miles between breeding and winter sites (Engle, 2001). Long distance (more than three miles) movements by spotted frogs are uncommon (Patla et al., 2005). The re-introduction of beaver to lower Bear and Shack Creeks would help improve habitat (e.g. create ponds, aggrade stream channels, raise the water table, expand the riparian zone, alter stream flow (Pollock et al., 2007) in areas with adequate riparian vegetation and facilitate establishment of persistent spotted frog populations in these drainages. Spotted frog habitat enhancement would allow mechanically or manually created ponds to function as breeding habitat (CSFTT, 2003; Lohr and Haak, 2009). Gabions or straw bales with filter cloth could be used to retain water in the creeks for a longer period. Elevated water tables and more permanent water in intermittent streams would also result in additional establishment of willows, sedges, and other vegetation improving habitat for riparian group special status wildlife in the long term. Restoration (planting willows, aspen, sedges, or rushes) of riparian areas, particularly Bear Creek tributaries and Shack Creek, would restore connectivity and allow for some expansion of spotted frog habitat. In the long term, spotted frog distribution would be similar to the present distribution, unless spotted frogs were transplanted into other drainages. Isolated populations of amphibians would be more likely to be extirpated by events (e.g., drought) and once eliminated, less likely to be recolonized. Maintaining even small wetlands are important to provide connectivity (Semlitsch and Bodie, 1998) and facilitate the movement of surplus of juveniles which function as a population source

Willow flycatcher and Lewis's woodpecker would benefit from planting riparian shrubs and trees. The breeding distribution would likely have a minor to moderate increase at the local scale in the long term. Beneficial impacts to willow flycatcher distribution at the planning area scale would be negligible in the long term.

Alternative I would rank second least for riparian and fourth most for upland habitat restoration.

Impacts from Management Specific to Alternative II

Alternative II would have a long-term objective of maintaining, but not increasing 347,000 acres of shrubland habitat. The vegetation objective for native shrubland habitat would be 5,000 acres in VMA A and 125,000 acres in VMA B. Restoration occurring in slickspot peppergrass habitat would focus on the portion of occupied habitat in VMA B. Restoration of sage-grouse habitat in VMA C and D would be a lower priority than restoration in VMA A and B. The amount of habitat for several sagebrush steppe group special status wildlife species would remain relatively static in the long term. The impact of restoration

would be minor at the local scale and negligible at the planning area scale in the long term. Alternative II would result in little or no restoration for bighorn sheep or tiger beetle habitat due to their lower priority as special status wildlife. Restoration of tiger beetle habitat would be low in Alternative II.

Sagebrush would be allowed to reestablish naturally in native grasslands to the extent a seed source remains, in Alternative II. However, because of large wildland fires, the sagebrush seed source has been eliminated over large portions of the planning area extending recovery time. Natural recovery of Wyoming big sagebrush steppe habitat adequate to provide suitable habitat for special status wildlife would take one (Wambolt and Payne, 1986) to several (Baker, 2006; Baker, 2011) decades depending on scale and assuming the absence of additional wildland fire. A more likely scenario, however, is that sagebrush would continue to decline due to wildland fire in extent across the planning area at a rate that outpaces re-establishment. The distribution of sage-grouse and sharp-tailed grouse leks would likely decline due to limited sagebrush habitat, future wildland fires, and the slow natural recovery time. Habitat loss effects would contribute to local extirpation of some sagebrush steppe special status species, such as pygmy rabbit, and inhibit re-colonization of isolated sagebrush steppe islands (Hanser and Huntly, 2006). Retaining large areas as non-native perennial grassland would maintain low prey abundance and diversity over a large area. Ferruginous hawk and prairie falcon distribution in the planning area would not likely change but the number of occupied nesting territories would fluctuate or likely decline (Steenhof et al., 1999) because of the less stable prey abundance and diversity in grasslands particularly during drought (Van Horne et al., 1998).

Bighorn sheep, northern goshawk, Lewis's woodpecker, and tiger beetle distribution would remain the same. The distribution of special status wildlife in aspen and duneland habitat would remain the same as Alternative I. Spotted frog in Rocky Canyon would remain vulnerable to extirpation by local disease, failure of beaver dams or regional events (e.g., drought) and, once eliminated, are less likely to be recolonized due to limited long distance movements. Alternative II would be second least beneficial for special status wildlife in the long term. Beneficial impacts would be negligible at the local and landscape scales.

Alternative II lacks an objective for achievement of PFC from streams not currently at PFC. Alternative II would only improve the miles of streams not at PFC to be moving toward PFC over the life of the plan, not to achieve PFC. Spotted frog habitat may be maintained in Rocky Canyon Creek. Riparian areas in fenced reference areas would be less than Alternative I due to the small size and fewer reference areas in this alternative. The release of beaver to improve riparian function and spotted frog habitat would be prohibited in Alternative II. All occupied or historic spotted frog habitat lies in VMA D, which would not be a priority for restoration.

Natural recovery of the miles of riparian areas in the fenced reference areas would be less rapid than outside the exclosures, due to less bank alteration and utilization of riparian plants. Improvement of habitat would increase the amount available for special status wildlife in the riparian group. Riparian habitat along the Snake River which has sporadically been used by yellow-billed cuckoo would be priority for maintenance of yellow-billed cuckoo habitat.

Alternative II ranks second least for upland restoration and tied for least with the No Action Alternative for riparian restoration.

Impacts from Management Specific to Alternative III

The desired condition would be to increase shrubland habitats by 200,000 acres. Special status species habitat would be a priority for restoration in Alternative III, with emphasis in Areas of Critical Environmental Concern and VMA D. Shrubland habitat in VMA D would increase from 97,000 acres to 119,000 acres. Increases in shrubland would include sagebrush steppe with lesser amounts of mountain mahogany/mountain shrub habitats. No treatments in VMA A would increase native shrubland. Restoration in VMA D would increase 22,000 acres habitat for sage-grouse and sharp-tailed grouse over the long term. The increase in habitat would be minor to moderate at the local scale and negligible at the planning area scale. Restoration of the 190,000 acres of habitat in other VMAs would be moderate to major at the local scale and minor to moderate at the planning area scale long term. Species benefitting

include sage-grouse, sage sparrow, Brewer's sparrow, and loggerhead shrike. Because of pygmy rabbits occur where sagebrush is tall and dense recovery of pygmy rabbit habitat would be delayed in comparison to recovery of than sage grouse habitat. Occupied ferruginous hawk nesting territories would remain stable over time, particularly in the southern third of the planning area, because of sagebrush steppe restoration.

Impacts of future treatments in aspen would be the same as discussed in the No Action Alternative. The abundance of special status wildlife using aspen habitats is expected to remain static. Treatment of duneland habitat for tiger beetles would be a priority in Alternative III.

Miles of riparian areas in reference areas in Alternative III would exceed Alternative II. Miles of riparian areas to be restored and managed to achieve PFC would increase from 85 miles to 193 miles. Riparian habitats for spotted frog in VMA D and northern leopard frog, western toad, willow flycatcher, and yellow-billed cuckoo in VMA A would be priorities for improvement. Alternative III would allow the re-introduction of beaver and other techniques to speed riparian function in suitable habitat similar to Alternative I.

In the long term, an increase of 200,000 acres of sagebrush steppe would increase the current distribution of a number of special status wildlife species; beneficial impacts would be moderate at the local scale and minor at the planning area scale. Distribution of special status wildlife in aspen, canyonland, or duneland habitat would be similar to Alternative I.

Alternative III is tied with Alternatives IV, V, and VI for having the most riparian habitat achieving PFC, but it would be third least in the amount of upland habitat restored for species status wildlife.

Impacts from Management Specific to Alternative IV

The desired condition would be to increase shrubland habitats by 582,000 acres. Acres of aspen restoration and impacts from restoration would be the same as in the No Action Alternative. Restoration of duneland habitat would be a lower priority for treatment, but treatment would be the same as in Alternative I with the same impacts. Alternative IV would result in beneficial moderate to major impacts for the sagebrush steppe special status wildlife.

The mileage of riparian areas in reference areas would be the same as in Alternative I with the same affects. Riparian areas at PFC would increase from 85 to 183 miles. More restoration would occur in riparian areas. Because restoration of special status species habitat is a priority in Alternative IV habitat for spotted frogs would improve. Short-term benefits would be negligible at the local and landscape scales. Beneficial effects of riparian s attaining of PFC would be minor to moderate at the local and landscape scales.

The distribution of sage-grouse leks and lek attendance would increase as restored sagebrush steppe habitat suitability improves over time. A similar effect is projected for sharp-tailed grouse using the mountain mahogany/mountain shrub habitat. The rate of recovery would be accelerated compared to the other alternatives because of an increase in active restoration. VMAs D and C where most of the remaining sagebrush steppe, aspen, and mountain mahogany/mountain shrub habitats are located are high priorities for vegetation treatments.

The distribution of spotted frogs would be enhanced in Alternative IV similar to Alternative I in the short and long term. The effects on the distribution of tiger beetle and special status wildlife in the aspen group would be similar to Alternative I. Effects to bighorn sheep would be the same as the Alternative I. Overall, Alternative IV would restore the most upland habitat and is tied for first in riparian zone attaining PFC.

Impacts from Management Specific to Alternative V

Shrubland, primarily sagebrush steppe would increase by approximately 438,000 acres for all VMAs. Increases in habitat would be slow and patchy resulting in minor increases of habitat at the local scale and negligible to minor increases at the planning area scale in the long term. Juniper would continue to increase in aspen stands, reducing aspen stand vigor in the long term.

The amount of riparian area improving to PFC would be the same as in Alternative III. However, Alternative V includes the most riparian habitat in reference areas. Natural recovery of the riparian areas in the exclosures would likely be faster because of increased protection.

The number of sage-grouse leks and distribution of leks would increase slowly over time since treatments would occur in smaller patches scattered over the area to be restored. The patches would then expand at a natural rate assuming adequate control of future wildland fires. Some of the small patches would be suitable for Brewer's sparrow in less than 20 years. Because the habitat patches would be small, they would likely function as population sinks for Brewer's sparrow, sage sparrow, and sage-grouse until they form more contiguous habitat. As riparian shrubs mature, willow flycatchers would likely expand and use the habitat.

Habitat improvement for spotted frog would be impaired due to the prohibition on beaver transplants. The impacts to spotted frog would be similar to Alternative II. Distribution of bighorn sheep, Lewis's woodpecker, spotted frog, and tiger beetle would not change. The increase in sagebrush steppe would rank third most in Alternative V, with moderate beneficial impacts for special status wildlife in the long term.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Restoration of approximately 164,000 acres in VMAs D and C would benefit a number of special status wildlife species including: sage-grouse, sharp-tailed grouse, pygmy rabbit, Brewer's sparrow, and loggerhead shrike. The desired future condition would be approximately 830,000 acres of shrubland habitat, mostly sagebrush steppe with a lesser amount of mountain mahogany/mountain shrub. Benefit to sage-grouse, sage sparrow, Brewer's sparrow, and pygmy rabbit would occur as the sagebrush matures in the long term.

Like Alternative III 183 miles of riparian area would achieve PFC. Miles of riparian area within references would be similar to Alternative II, with similar impacts. Alternative VI would allow the full suite of restoration options including beaver transplants to improve riparian areas.

Increased suitable habitat would be expected to increase in the distribution and number of sage-grouse leks in the long term due to increased populations. Improvement of riparian vegetation in these VMA D would also benefit willow flycatcher, Calliope hummingbird and spotted frog. Effects to special status wildlife are expected to be greater than the No Action Alternative. It would resemble Alternative IV but with a reduced level of restoration. Alternative VI would provide the second most shrubland habitat and be tied for the most riparian habitat achieving PFC. In the long term, impacts of Alternative VI would be beneficial and moderate to major at the landscape scale for special status wildlife.

Impacts from Wildland Fire Ecology and Management Actions

Wildland fire can rapidly alter habitat over vast areas. Woody species take substantial recovery time to provide habitat similar to pre-burn conditions. Until recovery has occurred, burned areas would be either unsuitable or marginally suitable for sage-grouse (Beck et al., 2009) and other BLM Sensitive species. Although wildland fire may kill aspen trees, the aspen survives by producing new trees from root sprouts. Burned mature standing aspen can continue to provide suitable nesting habitat for special status woodpeckers for several years. However, mature burned aspen will have collapsed before the sprouts achieve a large enough diameter for woodpeckers.

Fuels treatments would help restore more natural fire cycles and in the case of fuel breaks, potentially hinder fire spread. More information regarding fuels and fire is contained under *Impacts from Wildland Fire Ecology and Management Actions* in the *Wildlife* section. Table 4-167 provides a comparison between alternatives.

The following indicator was used to analyze impacts from Wildland Fire Ecology and Management actions on special status wildlife species:

- Acres with special management (critical fire suppression areas and wildland fire infrastructure).

ACEC. The Salmon Falls Creek ACEC includes 31 miles of redband trout habitat in Salmon Falls Creek. Both of the ACECs receive a limited amount of human use due to the steep canyon walls that limit access. The impacts to riparian and habitat conditions are primarily related to recreational uses and an increased occurrence of invasive plants. ACEC management for the No Action Alternative is special status fish and aquatic invertebrate species expected to maintain PFC and HC ratings, which would maintain riparian and habitat condition for special status fish and aquatic invertebrate species over the life of the plan. The No Action Alternative would rank fourth in miles of priority reaches within ACECs. It would have fewer risks for impacts to riparian and habitat conditions for special status fish and aquatic invertebrate species than Alternatives II, III, and VI but more than the other alternatives.

Impacts from Management Specific to Alternative I

Alternative I would designate four ACECs with special status fish and aquatic invertebrate species as a relevant and important value (Appendix M): the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, Salmon Falls Creek, and Sand Point ACECs. These ACECs would include 140 miles of perennial stream with special status fish and aquatic invertebrate species as a relevant and important value. These ACECs encompass seven miles of conservation reaches and eight miles of restoration reaches; the same as for the No Action Alternative, more than for Alternatives II, III, and VI but less than Alternatives IV and V. Alternative I would rank third in miles of perennial stream and fourth in miles of restoration reaches within ACECs.

The Bruneau-Jarbidge ACEC would include most of the designated critical habitat for bull trout except for portions along the West Fork of the Jarbidge River and its tributary Deer Creek, Dave Creek and a portion of the lower Bruneau River. There are seven miles of conservation reaches in the Bruneau-Jarbidge ACEC. Management changes for this ACEC would directly or indirectly improve PFC and HC ratings on 96 miles of perennial stream occupied by bull trout and/or redband trout. Identifying the ACEC as a high priority for the treatment of noxious weeds and invasive plants would reduce the potential for non-native vegetation to displace native riparian vegetation. Identifying the ACEC as a critical suppression area would reduce the potential for a reduction in PFC and HC ratings from wildland fire and wildland fire suppression activities. Alternative I contains more management direction for the Bruneau-Jarbidge ACEC than the No Action Alternative. All actions to maintain or improve relevant and important values for the ACEC would comply with the restoration priorities in the Aquatic and Riparian Management Strategy (ARMS; Appendix D, tables D-3, D-4, and D-5) and Endangered Species Act (ESA) consultation, where required, which would minimize the potential to reduce PFC and HC ratings in bull trout and/or redband trout habitat.

The Lower Bruneau Canyon ACEC would encompass a 2-mile reach of the lower Bruneau River and the associated geothermal hot springs. All actions implemented to maintain or improve relevant and important values for the ACEC would promote the maintenance and improvement of riparian condition in the ACEC. The maintenance or improvement of the geothermal hot springs and seeps as a relevant and important value for the ACEC would comply with the recovery plan requirements for the Bruneau hot springsnail and their habitat. Geothermal development is the primary threat to Bruneau hot springsnails (FWS, 2002). Closing the ACEC to mineral leasing would prevent geothermal development in the ACEC. Identifying the ACEC as a high priority for noxious weeds and invasive plant treatments would reduce the potential for non-native vegetation to displace native vegetation. Identifying the ACEC as a critical suppression area would reduce the potential for a reduction in PFC and HC ratings from wildland fire and wildland fire suppression activities. Not recommending the ACEC be withdrawn from locatable mineral development may result in impacts to riparian conditions if development occurs within the RCA.

The Middle Snake ACEC would encompass an 11-mile reach of the Snake. All actions to maintain or improve relevant and important values for the ACEC would promote the maintenance and improvement of riparian condition in the ACEC. Many of the livestock grazing-related impacts to the Snake River have already been mitigated through ESA consultation requirements for Snake River snails. Impacts to BLM Sensitive white sturgeon and their habitat would also be locally reduced from this management direction.

The Salmon Falls Creek ACEC would include approximately 31 miles of redband trout habitat in the Salmon Falls Creek Canyon. Identifying the ACEC as a high priority for the treatment of noxious weeds

Impacts from Management Specific to the No Action Alternative

The entire planning area was categorized as full suppression in the No Action Alternative. National policy mandates wildland fires in the wildland urban interface (WUI) have the highest suppression priority. In some instances, wildland fire suppression in the WUI would divert suppression resource from other areas including sage-grouse habitat. Idaho BLM policy elevated the suppression priority of sage-grouse habitat to second following the WUI. Based on fire history and recent trends, habitat for sage-grouse and other sagebrush special status wildlife would likely continue to be reduced.

Seeding native cultivars and forbs increases residual herbaceous height used by sage-grouse. Alfalfa and yarrow (Wallestad et al., 1975) are two upland forbs commercially available for emergency stabilization and burned area rehabilitation (ES&BAR) treatment eaten by sage-grouse. In the short term, planting grasses and forbs increases residual herbaceous height. Seeding or planting shrubs increases shrub cover in treated areas improving habitat for sagebrush steppe and mountain mahogany/mountain shrub wildlife groups in the long term. Temporary fences installed following wildland fires as part of ES&BAR can be a source of mortality to sage-grouse. To reduce potential mortality to sage-grouse or other special status wildlife, temporary fences would be marked with visible vinyl strips on the top wire to make them more visible to wildlife (Stevens et al., 2012) if they are in close proximity (0.25 miles) to either a sage-grouse or sharp-tailed grouse lek. A let-down fence could also be constructed to minimize the likelihood of special status wildlife collisions as appropriate. Temporary fences would result in a short-term increase in infrastructure density at the local scale. Shrubs are usually damaged or killed during temporary fence construction, maintenance, and removal in sagebrush steppe and mountain mahogany/mountain shrub habitats in near the fence line. Adverse impacts to special status species habitat have been moderate to major at the local and landscape scales. Overall the No Action Alternative is least beneficial.

Impacts from Management Specific to Alternative I

New routes and water pipelines would lead to increased access and disturbance in areas that currently have little disturbance. Impacts of temporary fences for ES&BAR are the same as described in the No Action Alternative. Pipelines for installation of new water storage would increase the density infrastructure with minor to moderate impacts at the local scale in the long term. Sediment from increased public use of new or improved stream crossings could result in an increase in sediment in spotted frog or other special status amphibian species habitat.

Approximately 11,000 acres of 300 foot wide fuel breaks (about 300 miles) would be installed in Alternative I. During installation fuel breaks would potentially damage habitat for sensitive species. Special status wildlife living underground may have their burrows collapsed. If disking, harrowing, or drill seeding occurs during nesting, the nests of some special status birds may have their nests, eggs or young damaged resulting in localized mortality. Fuel breaks would be maintained long term as grassland habitat, reducing sage-grouse habitat if placed in shrublands. To remain effective, fuel breaks would have to be periodically treated (mowed). Special status wildlife would be temporarily displaced while mowing occurs. Placement of fuel breaks or new roads in the majority of bighorn sheep habitat is not anticipated due to management direction for Wilderness, Areas of Critical Environmental Concern, and topography. To the extent fuel breaks convert sagebrush steppe or mountain mahogany/mountain shrub habitats to grassland, fuel breaks would reduce or divide shrubland habitats.

Projects to establish shrubs to restore natural fire cycles would increase shrubland habitat for pygmy rabbit as well as nesting and winter habitat for sage-grouse and sharp-tailed grouse. Refer to the *Impacts from Vegetation Communities Actions* in the *Special Status Wildlife* and *Impacts from Vegetation Communities Actions* in *Wildlife* sections for analysis.

In Alternative I, approximately 286,000 acres of sagebrush steppe habitat are in critical suppression areas. The acres of other group habitats for special status wildlife in critical suppression areas are listed in Table 4-167.

Impacts of fuel breaks and new suppression infrastructure to wildlife group habitats were addressed under *Impacts from Wildland Fire Ecology and Management Actions* in the *Wildlife* section. These impacts would apply to sensitive species. Depending on the location and nature of the adjacent habitat, a

few fuel breaks could potentially form sites suitable for displaying grouse (Connelly et al., 1981) by reducing shrub cover or creating openings. Due to past wildland fires and the transformation of large areas of shrub steppe to grassland, the effects of new disturbances on creating additional sage-grouse or sharp-tailed grouse lek habitat would be negligible. Beneficial impacts of Alternative I would be moderate to major at the landscape scale in the long term. Alternative I ranks second of the alternatives.

Impacts from Management Specific to Alternative II

About 13,000 acres fuel breaks would be installed. Other wildland fire-related infrastructure would include new/improved roads, new pipelines, and water storage (e.g. new ponds or tanks, and increasing the size of some existing ponds). The new pipelines, roads, and other facilities would increase infrastructure density a minor to moderate amount in the short and long term at the local scale. Impacts of temporary fence would be the same as the No Action Alternative.

Alternative II would have 168,000 acres of critical suppression areas of which 51,000 acres would be sagebrush steppe habitat. Areas in Vegetation Management Areas (VMAs) A and B would have the highest suppression priority during multiple ignitions, giving suppression of wildland fires in sagebrush steppe a lower priority than non-native perennial grassland. Long-term decreases in sagebrush steppe and mountain mahogany/mountain shrub habitats in VMAs C and D would likely occur because of the reduced suppression priority. Alternative II would be second least beneficial to special status wildlife habitat. Impacts to special status species habitats have been moderate to major at the local and landscape scales.

Impacts from Management Specific to Alternative III

Alternative III has the greatest amount of wildland fire infrastructure including new roads, improved roads, and improved stream crossings. New guard stations, helispots, water pipelines, storage tanks, and ponds would increase infrastructure having a moderate impact at the local scale in the short and long terms. New or better roads and new guard stations would reduce the response time to wildland fires with the objective of reducing fire size. Some of the 44,000 acres 500-foot wide fuel breaks would be aligned to in part protect special status species habitat. Table 4-167 lists the amount of vegetated and unvegetated fuel breaks. Annual treatments to maintain unvegetated fuel breaks would increase disturbance locally. Unvegetated fuel breaks would represent a loss of about 19,000 acres of habitat and divide habitats where the fuel breaks were located. Habitat changes from wildland fire infrastructure would generally be minor to moderate locally in the short and long term. Unvegetated fuel breaks would be moderate to major at the local scale in the short and long term. At the planning area scale, wildland fire-related infrastructure would be minor to moderate depending on the amount of infrastructure associated with other resource uses. Effects of temporary ES&BAR fences are the same as described in the No Action Alternative.

Approximately 286,000 acres of sagebrush steppe habitat are identified as critical suppression areas in Alternative III. Critical suppression areas in VMAs B and A would have the highest suppression priority during multiple ignitions increasing the risk of key sage-grouse habitat in VMA C to larger wildland fires. Alternative III would potentially be the most beneficial of the alternatives. Impacts would be moderate to major at the landscape scale in the long term.

Impacts from Management Specific to Alternative IV

Alternative IV would have the same amount of fuel breaks as Alternative I with the same impacts. Other wildland fire-related infrastructure would be similar to Alternative I with similar impacts.

Alternative IV-A would contain 305,000 acres of sagebrush steppe as critical suppression areas, whereas IV-B would have about 6,000 acres less. All of the mountain mahogany/mountain shrub and aspen habitats are located in VMAs C and D which have high priority for wildland fire suppression during multiple ignitions. Alternative IV would be third most beneficial of the alternatives having a moderate to major impact at the landscape scale in the long term.

Impacts from Management Specific to Alternative V

Alternative V would not allow new pipelines or new road to be installed to aid in wildland fire suppression. Placement of a portion of the vegetated fuel breaks in sagebrush steppe or mountain mahogany/mountain shrub habitats would shift habitat from shrubland to grassland. Habitat conversion or fragmentation due to fuel breaks would be minor to moderate at the local scale in the short and long term. At the planning area scale maintaining fuel breaks would be minor in the long term. Existing roads and stream crossing could be repaired to reduce travel time to wildland fires which would result in negligible change in infrastructure at the local scale in the short and long term. ES&BAR temporary fences would not be allowed in native plant communities eliminating potential mortality to special status wildlife or damage (broken brush due to fence construction, maintenance and livestock trailing) to their habitat associated with temporary fences.

Approximately 1,038,000 acres would be categorized as critical suppression areas including 315,000 acres of sagebrush steppe habitat used by special status species. All of the aspen and nearly all the mountain mahogany/mountain shrub habitats would be in the critical suppression areas. The large amount of area listed for critical suppression reduces the effectiveness of prioritization to a degree. Within the critical suppression area, other suppression priorities would help focus suppression efforts. Impacts special status species habitat would be moderate to major at the local and landscape scales. Overall the Alternative V would be third least beneficial in the long term.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would not allow unvegetated fuel breaks eliminating impacts of initial installation and annual maintenance. Alternative VI would allow vegetated fuel breaks similar to Alternative I. Alternative VI would allow new pipelines, new roads, route improvement, water storage and other infrastructure similar to Alternative III. Effects of this infrastructure would be the same as Alternative III.

Critical suppression areas total about 596,000 acres including 296,000 acres of sagebrush steppe habitat used by special status species. Within this, key sage-grouse habitat would be a high suppression priority following the WUI. Having key sage-grouse habitat as a suppression priority would likely help reduce the conversion of sagebrush steppe to grassland. Alternative IV rank fourth most beneficial to special status wildlife. Potential beneficial impacts would be moderate at the landscape scale in the long term.

Impacts from Livestock Grazing Actions

In Oregon, spring grazing (grasses in the boot stage, May to June) was found to increase the nutritional quality in regrowth of three (Ganskopp et al., 2004a) and six species (Ganskopp et al., 2007) of grass that persisted into December (Ganskopp et al., 2004a). Although the nutritional quality improved, grass biomass was reduced by approximately 32% to 67% for the light and heavily grazed treatments, respectively (Ganskopp et al., 2004a). The authors cautioned of “negative effects of grazing cool season grasses during the boot stage” and wrote that spring grazing could be an option in grazing deferment or rotation systems (Ganskopp et al., 2004a). Most of the grasses in these studies are found in the planning area.

Domestic sheep are potentially able to transmit disease to bighorn sheep contributing to population die-offs (Besser et al., 2012; Dassabayake et al., 2010; Lawrence et al., 2010; Schommer and Woolever, 2008; Western Association of Fish and Wildlife Agencies, 2012).

The relationship between livestock grazing and impacts to sage-grouse and their habitat are complex and influenced by numerous factors including but not limited to time of year, distribution of livestock, utilization levels, grass species present, and plant growth as influenced by weather. One of the hypothesized link is the relationship between residual herbaceous vegetation height available during nesting and early brood rearing (Connelly et al., 2000; Connelly et al., 2011b). Research summarized by Connelly and others (2004) indicates sage-grouse nesting success is usually higher in areas with taller residual herbaceous vegetation compared to shorter residual herbaceous vegetation. Connelly and others (2000) recommended that residual herbaceous cover average 18 centimeters (about seven inches) to provide adequate cover for sage-grouse nesting and early brood rearing. Hausleitner and others (2005) reported that grass height increased two inches or more between nest initiation to hatch in Colorado due to grass

growth. At this time, there is no peer-reviewed scientific literature addressing livestock grazing seasons of use and impacts to sage-grouse displaying and breeding. Cattle have been observed flushing sage-grouse from nests (Coates et al., 2008) potentially contributing to nest abandonment and, in one instance, cattle damaged sage-grouse eggs (Coates, 2007; Coates et al., 2008). It is not known if sage-grouse flushed from nests by livestock have a greater chance of subsequent nest predation by ravens or other nest predators.

Livestock grazing is not believed to substantively affect the ferruginous hawk prey base and may promote hunting efficiency of ferruginous hawks in the northern Great Plains by reducing cover (Dechant et al., 2003d). White and Thurow (1985) reported that livestock did not cause ferruginous hawks to abandon nests. However, livestock use ferruginous hawk nest trees for rubbing (White and Thurow, 1985) and shade, which can weaken roots causing them to collapse over time (Olendorff, 1993). In southeastern Oregon and northern Nevada survival rates of pygmy rabbit were highest and lowest in areas grazed (Crawford et al., 2010) whereas pygmy rabbit survival in the ungrazed area was intermediate compared to the grazed sites. In the Columbia Basin of Washington, Thines and others (2004) reported pygmy rabbit were more abundant in ungrazed areas compared to grazed areas. Although Thines and others (2004) observed pygmy rabbit burrows collapsed by livestock, this potential impact was not quantified. Bull and Hayes (2000) reported livestock grazing had no significant effect on spotted frog reproduction in Oregon.

Acres of special status wildlife habitat components and new fencing for reference areas within areas available for livestock grazing are presented in Table 4-168 for each alternative.

The following indicators were used to analyze impacts from Livestock Grazing actions on special status wildlife species:

- Acres with special management emphasis (acreage available for livestock grazing, separation of domestic sheep and goats from bighorn sheep habitat) and
- Relative change in the amount of herbaceous cover for wildlife

Table 4-168. Selected Special Status Wildlife Habitat Components and New Reference Area Fencing within Areas Available for Livestock Grazing by Alternative

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Estimated new fence for Reference Areas (miles)	0	150	52	75	150		0	39
Riparian/Perennial streams (miles)	125	94	111	111	96		58	100
Bighorn sheep habitat (acres)	29,000	28,000	28,000	28,000	28,000		28,000	28,000
Key sage-grouse habitat (acres)	309,000	306,000	309,000	308,000	295,000	301,000	244,000	313,000
Sage-grouse leks (occupied)	91	91	91	91	84	90	73	91
Sage-grouse leks (other)	91	89	91	91	81	83	65	91
Sage-grouse leks (unoccupied)	26	26	26	26	23	25	19	26
Sharp-tailed grouse leks (occupied)	2	2	2	2	2		2	2
Ferruginous hawk (nest sites)	66	66	66	66	64	66	58	66

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Lewis's woodpecker (sites)	27	26	26	26	26		26	26
Prairie falcon (nest sites)	23	19	21	21	19		12	19
Pygmy rabbit (sites)	65	61	64	64	60		40	64
Spotted frog (streams)	5	5	5	5	5		5	5
Bruneau Dunes tiger beetle (acres)	700	700	700	700	700		700	700

Impacts from Management Specific to the No Action Alternative

The 1987 Jarbidge RMP and 1989 plan amendment established amounts of range infrastructure by multiple use areas. Fence, water pipelines, and troughs would continue to increase under the No Action Alternative in some multiple use areas. Fences contribute to sage-grouse mortality (Stevens, 2011; Stevens et al., 2012). In southern Idaho, higher fence densities increased sage-grouse mortality (Stevens et al., 2012). Population level impacts of fences remain unknown. Human disturbance (e.g., project maintenance, hauling salt, herding, or checking on livestock) associated with livestock grazing would continue and may occasionally disrupt sage-grouse displaying or nesting. The impact would be minor at the local scale and negligible at the planning area scale in the short and long term because the majority of leks are more than 0.25 miles from fences or water pipelines where human disturbance is more likely. The influence of livestock grazing on the ferruginous hawk prey base is unknown.

Within the area available to livestock grazing, about 314,000 acres would be sagebrush steppe and 309,000 acres of key sage-grouse habitat. The No Action Alternative restricts converting cattle animal unit months (AUMs) to domestic sheep AUMs in allotments with bighorn sheep habitat unless fencing or topography can satisfactorily maintain separation. Because no buffer distance is recommended there would be an increased risk of bighorn sheep being exposed to disease from domestic sheep. Although most bighorn sheep remain in the canyons, some have been found more than one mile from the canyon rim. If bighorn sheep contracted pneumonia from domestic sheep the population would be reduced rapidly and the disease would likely reduce lamb survival. Effects of disease in bighorn sheep were addressed in the Impacts from Special Status Wildlife Actions section.

Livestock AUMs could increase to a total of 260,000 AUMs in the No Action Alternative. The No Action Alternative does not have specific utilization levels. Based on monitoring, utilization levels currently vary between less than 20% to more than 50% in portions of some pastures. Based on the utilization gauge (USDA, 1980) 50% utilization of 22-inch tall native grasses within the planning area (e.g., Idaho fescue - 2.5 inches, Sandberg bluegrass – less than 4.0 inches, and bluebunch wheatgrass - 4.5 inches) in the sagebrush steppe and mountain mahogany/mountain shrub habitats would generally lack adequate residual herbaceous height for nesting sage-grouse and sharp-tailed grouse. At 50% utilization a 22-inch tall crested wheatgrass would have about 5 inches of residual cover. At 20% use, residual herbaceous heights of the same grasses would be near or exceed the nesting cover requirements. It is important to note livestock grazing is not uniform on individual plants (e.g., only parts of an individual plant may be grazed) nor uniform over a pasture. In general, as the utilization rate increases, grasses are more uniformly grazed. Temporary non-renewable (TNR) permits would be issued which could reduce herbaceous cover.

The No Action Alternative would have the fourth least AUMs, but lacks clear direction on use levels, and placement of grazing-related infrastructure. Overall, the No Action Alternative would be second least beneficial for special status wildlife.

Impacts from Management Specific to Alternative I

Approximately 150 miles of fence would be needed to enclose 75 reference areas, each about 160 acres in size. This amount of fence would be reduced to the extent existing fences or natural barriers exclude livestock access. Other fence may be constructed to protect resources such as riparian areas or tiger beetle habitat or enhance grazing management, which would increase mortality for some special status wildlife. Placing markers on the top wire of new and existing fences would reduce sage-grouse fence collision mortality over 80% (Stevens et al., 2011). Fence marking would reduce the risk of fence collision with other upland special status wildlife like ferruginous hawks. Improved livestock distribution as a result of new water developments and fences would increase travel routes. Increases of fence and water pipelines would increase infrastructure density. Changes in infrastructure would likely be minor to moderate at the local scale and minor at the planning area scale.

The area available for livestock grazing includes 306,000 acres of key sage-grouse habitat. Alternative I would include management direction for shrublands and native plant communities within three miles of occupied sage-grouse leks. Pastures with native communities including those with Sandberg bluegrass/crested wheatgrass mix within three miles of occupied or status unknown leks would have a management emphasis of providing (greater than four inches) residual herbaceous nesting cover for sage-grouse. A 22-inch bluebunch wheatgrass would usually provide 5 or more inches of residual height at 40% use. However, relatively shorter stature native grasses (Sandberg bluegrass Thurber's needlegrass and Idaho fescue) would likely not provide enough residual grass height recommended for sage-grouse where these grasses are dominant. Maintaining residual grass heights would be more difficult during drought. Like the No Action Alternative, TNR permits may be issued reducing herbaceous heights locally. Alternative I would contain direction to provide for multi-aged aspen stands long term. Riparian management would maintain spotted frog habitat.

Grazing by domestic sheep or goats would not be allowed within nine miles of bighorn sheep habitat. This would reduce the risk of disease transmission between the species. Impacts of disease transmission between bighorn sheep and domestic sheep were addressed in the Impacts from Special Status Wildlife Actions section.

Alternative I allotted the third lowest number of AUMs, and tied with Alternative VI for the third most limited utilization rates. Alternative I ranks as the third most beneficial for special status wildlife with respect to livestock grazing. Beneficial impacts would be minor at the local and landscape scales in the short and long term.

Impacts from Management Specific to Alternative II

About 62 miles of fence would be needed to protect 62 reference areas, each about 40 acres in size. The amount of fence would be reduced to the extent existing fences or natural barriers exclude livestock access. To improve livestock distribution for the increased AUMs an unknown amount of new fence and water pipelines would be installed creating new routes. The combination of fences, water pipelines, and routes would increase infrastructure and human disturbance. In some areas, increases in fences could contribute to sage-grouse or other special status wildlife mortality locally. Expected increases in infrastructure density would be moderate to major at the local scale in the short and long term. At the landscape scale, increases in infrastructure would be minor to moderate.

The area available for livestock grazing includes 309,000 acres of key sage-grouse habitat. Alternative II applies sage-grouse management to pastures with more than 50% native shrublands within one mile of occupied sage-grouse leks. No seasonal restrictions would limit livestock use of breeding and nesting habitat for sage-grouse or sharp-tailed grouse. Native shrublands within one mile of occupied sage-grouse leks would have management emphasis to meet the four inch residual herbaceous height guideline for nesting sage-grouse. Higher use levels and AUMs (440,000) would likely result in more uniform utilization across pasture reducing the variation in residual cover. More infrastructure would also contribute more uniform livestock grazing within pastures. At 50% use on 22 inch tall Idaho fescue would result in less than 3 inches and Sandberg bluegrass less than 4 inches of residual grass height. This would not normally provide adequate residual height in the majority of the remaining sagebrush steppe habitat where these species dominate. A 22 inch tall bluebunch wheatgrass plant would provide about 4.5

inches of residual cover if grazed at 50%. Plant growth from April into June would somewhat offset reductions in residual cover (Hausleitner et al., 2005) and for bluebunch wheatgrass would likely be near the recommended residual cover height. Utilization levels to an estimated 60% in non-native perennial grass (crested wheatgrass) pastures would leave about 3.5 inches of residual cover. Issuance of TNR permits would further reduce herbaceous cover at the local scale

Alternative II lacks livestock grazing direction for aspen stands. Repeated heavy browsing of aspen sprouts by mule deer, elk, and livestock could reduce aspen recruitment (Kay and Bartos, 2000).

The higher use levels would likely result in more bank trampling and consumption of riparian/wetland vegetation along spotted frog streams. Although Bull and Hayes (2000) reported grazing did not have a negative effect on spotted frog reproduction and recruitment, they stated impacts of grazing intensity and timing require additional research.

Alternative II would be similar to the No Action Alternative due to limited direction on keeping domestic sheep or goats separated from bighorn sheep by a suitable distance and the risk of disease would be the same.

Alternative II ranks least beneficial to special status wildlife in the long term due to reduced buffer distances and direction, the most AUMs, and the highest utilization levels. Impacts would be moderate to major in the short and long terms at local and landscape scales.

Impacts from Management Specific to Alternative III

About 75 miles of fence would be needed to create 75 reference areas about 40 acres in size. The amount of fence would be reduced to the extent existing fences or natural barriers exclude livestock access. To facilitate livestock management, additional infrastructure would likely be constructed. A small increase in wildlife mortality from collision with the new fence would likely be expected locally. New fence and pipelines and subsequent routes created for construction and maintenance would increase infrastructure density and divide habitats. Impacts at the local scale would be minor to major in the short and long term. At the planning area scale effects would likely be minor to moderate in the long term.

Like Alternative II about 308,000 acres of key sage-grouse habitat would be in grazed pastures. Pastures with native plant communities within three miles of occupied or status unknown sage-grouse leks would have management emphasis to provide more than four inches of residual herbaceous cover. Alternative III would increase AUMs to 348,000. The effects of estimated utilization levels at 30% to 40% on native plant communities to achieve fire and resource objectives in Alternative III would be similar to Alternative I. The 50% to 60% use on non-native perennial vegetation would be similar to Alternative II. The increased number of AUMs and infrastructure would result in more uniform grazing levels.

Like Alternative I aspen would have more focused management. Riparian management would maintain spotted frog habitat.

A nine mile separation distance between bighorn sheep habitat and domestic sheep or goats would be maintained. Affects would be the same as those described in Alternative I in the *Impacts from Special Status Wildlife Actions* section.

Alternative III would allot the second most AUMs, provide the second most utilization, Alternative III ranks as the third least beneficial at a moderate level to special status wildlife at the local and landscape scales in the short and long term.

Impacts from Management Specific to Alternative IV

About 150 miles of new fences would be needed to create 75 reference areas, each about 160 acres in size, the same as Alternative I. The amount of fence would be reduced to the extent existing fences or natural barriers exclude livestock access. A limited amount of new fence may be constructed to protect resources. Fences would be reduced (Inside Desert Area of Critical Environmental Concern [ACEC]). Marking existing fence and new fence should reduce the collision hazard to less than current levels.

Infrastructure density would have a minor increase at the local and planning area scale in the short and long term.

Approximately 284,000 acres of key sage-grouse habitat would be in areas available to grazing in Alternative IV-A, and 295,000 acres would be available in Alternative IV-B. Pastures managed for sage-grouse would generally provide an average seven inches of residual herbaceous cover within three miles of occupied or status unknown sage-grouse leks which would enhance sage-grouse nest success. Both Alternatives IV-A and IV-B would reduce the AUMs by over 50% from the No Action Alternative. Estimated utilization levels of 20% to 30% to achieve resource objectives would be provide greater residual grass heights than the No Action Alternative. Assuming 22 inch grass heights and 30% utilization, Sandberg bluegrass and bluebunch wheatgrass would exceed six inches and Idaho fescue would be about five inches. Taller residual cover is expected to improve nesting success for both special status grouse species. TNR permits could be issued further reducing residual cover.

Alternative IV contains direction to promote aspen recruitment to maintain and create multi-aged aspen stands for special status wildlife in this group habitat.

The estimated 20% to 30% utilization levels would leave more vegetation and litter in watersheds with spotted frogs. Grazing management in riparian areas would maintain or improve habitat for spotted frogs and other special status wildlife.

A nine mile separation distance between bighorn sheep habitat and domestic sheep or goats would be maintained. Affects would be the same as those described in Alternative I in the Impacts from Special Status Wildlife Actions section.

Alternative IV ranks as the second most moderately beneficial for species status wildlife at the landscape scale in the long term. It also ranks second most beneficial at the local scale in the short term.

Impacts from Management Specific to Alternative V

Because the 46 reference areas are pasture sized, new infrastructure would be minimal and possibly be reduced in some areas. Sage-grouse collision mortality would not likely increase from new fence construction. Marking existing fences would reduce sage-grouse mortality from collisions with fences.

The area available for livestock grazing includes 244,000 acres of key sage-grouse habitat. The Sagebrush Sea ACEC which would contain most of the sage-grouse habitat would be managed for 10% to 20% utilization which is less than other alternatives. At this utilization a 22 inch Idaho fescue would leave about six and a half inches of cover; both Sandberg bluegrass and bluebunch wheatgrass would exceed eight inches. Native or non-native understory pastures within five miles of occupied or status unknown leks would be managed to meet sage-grouse cover requirements.

Direction with respect to grazing would be included for aspen stands and riparian areas which maintain or improve these habitats for special status wildlife.

The 85,000 AUMs would result in substantially more herbaceous cover for sage-grouse nesting than all other alternatives. At 30% utilization a 22 inch Idaho fescue would leave about four inches of residual grass height; both Sandberg bluegrass and bluebunch wheatgrass would exceed six inches. Sage-grouse management would extend five miles from leks. The prohibition against issuing TNR permits would maintain higher residual cover levels than all other alternatives. Taller residual cover is expected to improve nesting success for both special status grouse species.

A nine mile separation distance between bighorn sheep habitat and domestic sheep or goats would be maintained. Affects would be the same as those described in Alternative I in the Impacts from Special Status Wildlife Actions section.

With respect to livestock grazing Alternative V would have the most benefit of the alternatives to special status wildlife in the short and long term at the local and landscape scales.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Some fence, water pipeline, and troughs would likely be needed to enhance livestock distribution for the additional AUMs and to protect resources in some instances. About 62 miles of new fence would be needed to create 62 enclosed 40 acre reference areas, similar to Alternative II. The amount of fence would be reduced to the extent existing fences or natural barriers exclude livestock access.

The same acreage as in Alternative III would be available for grazing. Pastures having native plant or non-native understory plant communities (including Sandberg bluegrass/non-native perennial grass) would have a management emphasis to greater than or equal to four inches of residual herbaceous cover within three miles of occupied or status unknown sage-grouse leks and would promote sage-grouse nest success. Alternative VI would allow an increase 279,000 AUMs, third highest, at full implementation resulting in a limited reduction in reduced residual herbaceous cover used by sage-grouse at the local scale. Impacts of livestock grazing at 30% to 40% utilization in native shrubland and 40% to 50% in non-native perennial grass seedings to sage-grouse would be similar to Alternative I. Issued TNR permits would reduce herbaceous cover to some extent at the local scale.

Direction with respect to grazing would be included for aspen stands and riparian areas which maintain or improve these habitats for special status wildlife.

A nine mile separation distance between bighorn sheep habitat and domestic sheep or goats would be maintained. Affects would be the same as those described in Alternative I in the Impacts from Special Status Wildlife Actions section.

Overall Alternative VI ranks as the fourth most beneficial to special status wildlife in the short and long term at the local and landscape scales.

Impacts from Recreation Actions

It is expected that viewing and photographing sage-grouse and sharp-tailed grouse on leks and ferruginous hawks on nests would continue. Effects of photography or wildlife-viewing disturbance occurring at sage-grouse or sharp-tailed grouse leks multiple times during the breeding season are not known. Human disturbance from photography or wildlife viewing is generally considered negligible in the planning area. Connelly and others (2000) recommend that only one to three leks be made known to the public for viewing and photography, and camping on leks should be prohibited during the breeding season.

Reactions to human disturbance by raptors vary during time or year, species (Richardson and Miller, 1997), type and duration of disturbance (White and Thurow 1985), and among individuals within a species (White and Thurow, 1985). Displacement of adults from the nest may lead to mortality of the eggs or young, depending on weather and nest predators (Richardson and Miller, 1997), or abandonment of the nest and territory for the year (Andersen et al., 1990; Richardson and Miller, 1997; White and Thurow, 1985). Although some raptors habituate to some degree to disturbance, ferruginous hawks seemed to become more sensitized (White and Thurow, 1985).

Special Recreation Permits (SRPs) can be issued for events where numerous participants gather for specific forms of recreation. Examples of SRPs include permits for outfitters/guides, non-motorized or motorized races, large groups, and other activities. Depending on the type of SRP and time of year, some activities authorized in SRPs would displace wildlife or be a source of mortality to wildlife. To the extent race events stay on existing routes, damage to vegetation and habitat would be negligible. The staging area, starting line, check points, and finish line incur more habitat damage due to a greater concentration of participants, spectators, and vehicles in these areas. Disturbance would pose a greater risk to special status wildlife during winter, breeding, and nesting periods. Depending on the purpose, SRPs held from late spring through summer could contribute to nest abandonment or in some instances lead to direct special status wildlife mortality. Acres of group habitat by Special Recreation Management Areas (SRMAs) are presented in the *Wildlife* section.

The following indicator was used to evaluate impacts from Recreation actions on special status wildlife species:

- Acres with special management emphasis (SRMAs or Extensive Recreation Management Areas [ERMAs]) and focus.

Impacts from Management Specific to the No Action Alternative

The emphasis at the Hagerman-Owsley Bridge SRMA (3,000 acres) would remain motorized recreation. Trails in and adjacent to the SRMA would continue to expand increasing route density and disturbance. Cross-country motorized recreation would damage Piute ground squirrel burrows and may damage Brewer's sparrow, sage-sparrow or loggerhead shrike nests in the few sagebrush islands in this SRMA. Short- and long-term impacts would be minor to moderate at the local scale and negligible at the planning area scale.

The emphasis at the Jarbidge Forks (2,000 acres) would remain fishing and primitive camping. Frequently used sites in the Jarbidge Forks SRMA were improved to reduce visitor impacts to stream banks and vegetation in the 1990s. Generator noise associated with trailers would run periodically, potentially displacing some special status wildlife. Special status bat species may avoid the camp areas when foraging at night. Fishing and camping would continue in Jarbidge Forks SRMA. Displacement from disturbance would be localized considered negligible in the short and long terms. The No Action Alternative would rank last in having beneficial impacts to special status wildlife and their habitat.

Impacts from Management Specific to Alternative I

Canyonlands and Jarbidge Foothills SRMAs would not require additional infrastructure. Human disturbance in Canyonlands and Jarbidge Foothills would not increase substantially more than if these SRMAs were not designated. Additional infrastructure for the Jarbidge Forks would be unlikely or limited. Human disturbance would likely increase at the same rate as general use in the area.

Balanced Rock SRMA would be limited to improving the existing hiking trail and adding interpretative signs. Improving the trail would likely increase use (fishing, hiking, wildlife viewing, etc.) in portions of the canyon that presently receive little use. Prairie falcons nesting in cliffs in the area, but should be only minimally disturbed by fishermen or hikers along the riparian area.

Little Pilgrim SRMA would have routes improved, a parking area improved and barriers installed to reduce damage to vegetation. Other potential infrastructure could include picnic tables, fire rings, kiosks and a vault toilet. Fire rings would reduce the chance of fires escaping the camp area and burning the remnant patch of sagebrush steppe in the canyon.

Deadman/Yahoo already receives widespread motorized recreation use. Designation as an SRMA would likely increase human disturbance in this area. In addition to marked designated trails and open areas, parking areas, kiosks, and vault toilets would likely be installed in the Deadman/Yahoo SRMA. Route density would increase associated with the Deadman/Yahoo SRMA, primarily in the open areas. Having designated routes would help minimize the collapse of Piute ground squirrel burrows away from the trails and limit damage to primarily grassland habitat.

Salmon Falls Reservoir SRMA would have a variety of infrastructure including delineated parking areas, kiosks, vault toilets, and boat ramps (Salmon Falls Reservoir RMZ only). Infrastructure associated with Salmon Falls Reservoir SRMA would reduce damage to sagebrush steppe habitat caused by current use. Construction at Salmon Falls Reservoir would avoid the sage-grouse breeding and nesting periods. Construction after June may temporarily displace late nesting Brewer's sparrow, sage sparrow, and loggerhead shrike in the Brown's Bench area.

During construction of the infrastructure, some special status wildlife may be temporarily displaced. Human disturbance including motor vehicle use and generators associated with some camp trailers would potentially displace some individual special status wildlife. Topography near the parking areas should buffer noise to the uplands to some extent. Increases in infrastructure associated and human activity with

Alternative I would be minor to moderate at the local scale and negligible at the planning area scale in the short and long term.

SRPs would be issued after environmental analysis and include stipulations to minimize impacts to special status species or their habitat. For motorized events requiring an SRP, the route layout would avoid the Native Shrubland vegetation sub-group to the extent practical to minimize impacts to sagebrush steppe, aspen, mountain mahogany/mountain shrub, canyonland, and riparian habitats. Tiger beetle habitat would not be open for SRPs. Depending on the type of SRP and location, events could be precluded during particular seasons (i.e., winter, breeding, or nesting) or have time of day stipulations to avoid, reduce, or mitigate disturbance to special status species. During raptor nesting and sage-grouse breeding and nesting, SRPs would avoid known raptor nest sites or grouse leks with an adequate buffer zone.

Alternative I would have 36,000 acres primarily for motorized recreation, 282,000 acres for primitive recreation, and 7,000 acres primarily for fishing and camping. SRMAs would total 325,000 acres. Potential adverse impacts of designating these SRMAs would be negligible to minor at the local level and negligible at the planning area scale.

Alternative I would be tied with Alternatives III and IV for the third least beneficial to special status wildlife.

Impacts from Management Specific to Alternative II

The same infrastructure would be developed for the Little Pilgrim and Salmon Falls Reservoir SRMAs as was described in Alternative I. Additional infrastructure in the Jarbidge Forks would likely not be constructed. SRPs would be issued after the appropriate analysis with stipulations to reduce adverse impacts to special status species habitat, but temporal or spatial restrictions would be minimal. The limited temporal or spatial direction would not necessarily eliminate potential SRP impacts to sage-grouse during breeding, nesting, or wintering.

Approximately 7,000 acres of SRMAs would be designated in Alternative II. No SRMAs would focus on motorized recreation in Alternative II. The focus of the Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs would be primarily be fishing and camping. Potential beneficial effects of designating the SRMAs would be minor at the local scale and negligible at the planning area scale and were described in Alternative I. Alternative II would be second most beneficial to special status wildlife. Potential beneficial impacts would be minor to moderate at the local scale and negligible at the landscape scale, both short and long term.

Impacts from Management Specific to Alternative III

SRPs would be issued, with similar impacts as described for Alternative I. Some SRPs would not be authorized during wildland fire season, which would eliminate the risk of a wildland fire caused by SRP participants or spectators.

A total of 42,000 acres of SRMAs would be designated in Alternative III. The Deadman/Yahoo SRMA would focus on motorized recreation but be 2,000 acres smaller than Alternative I, however, effects would be similar. Jarbidge Forks, Balanced Rock, Little Pilgrim, and Salmon Falls Reservoir, totaling 8,000 acres would be the same as in Alternative I with the same impacts. Alternative III would be tied with Alternatives I and IV for the third least beneficial to special status wildlife. Potential beneficial impacts would be minor to moderate at the local scale and negligible at the landscape scale, both short and long term.

Impacts from Management Specific to Alternative IV

Infrastructure would be the same as described in Alternative I for the Canyonlands, Deadman/Yahoo, Jarbidge Forks and Salmon Falls Reservoirs SRMAs. Infrastructure and route density would increase in the Deadman/Yahoo SRMA whereas Salmon Falls Reservoir SRMA would see an increase in infrastructure but not routes. SRPs would be issued, with similar impacts as described for Alternative I.

Alternative IV would designate 190,000 acres as SRMAs. The Canyonlands SRMA would be the same size and have the same focus as in Alternative I with the same impacts. Deadman/Yahoo SRMA would

be approximately 34,000 acres focusing on motorized recreation. Jarbidge Forks and Salmon Falls Reservoir would be the same as Alternative I with the same impacts. Alternative IV tied with Alternatives I and II for third least beneficial to special status wildlife. Potential beneficial impacts would be minor to moderate at the local scale and negligible at the landscape scale, both short and long term.

Impacts from Management Specific to Alternative V

Infrastructure would not likely change in the Jarbidge Forks SRMA. Routes, parking areas, kiosks, and other infrastructure would be constructed at the Yahoo SRMA increasing route density and structures with minor to moderate impacts at the local scale. Short- and long-term effects at the planning area scale would be negligible. Route braiding and other damage would continue in sagebrush steppe habitat in the Salmon Falls Reservoir area. SRPs would be issued, with similar impacts as described for Alternative I.

Alternative V would create 5,000 acres of SRMAs. The Yahoo SRMA (3,000 acres) would focus on motorized recreation in the same location as the No Action Alternative. The limited size would lessen potential impacts to Piute ground squirrel. More concentrated use would likely minimize nesting by Brewer's sparrow. The Jarbidge Forks SRMA would be the same as Alternative I with the same impacts.

Overall Alternative V would result in the most beneficial impact to special status wildlife. Potential beneficial impacts would be minor to moderate at the local scale and negligible at the landscape scale, both short and long term.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Managing the Jarbidge Foothills, Canyonlands, and Luds Point as ERMAs would continue relatively low levels of recreation and maintain habitat for special status wildlife in those areas. Infrastructure at the Balanced Rock, Little Pilgrim, and Jarbidge Forks SRMAs would be the same as described in Alternative I with the same impacts. The motorized SRMAs and ERMAs would have an increase in infrastructure and route density. Human disturbance associated with motorized recreation would be located in an area with limited special status wildlife. This area also has low amounts of sagebrush steppe habitat. SRPs would be issued the same as Alternative I with similar impacts.

Alternative VI has approximately 304,000 of ERMAs (Canyonlands, Jarbidge Foothills, Luds Point, and Rosevear) which place less emphasis on recreation than SRMAs. SRMAs would total about 20,000 acres. The Deadman SRMA (13,000 acres), Yahoo SRMA (3,000 acres) and Rosevear ERMA (19,000 acres) would focus on motorized recreation, with impacts similar to Alternative IV. Impacts of Jarbidge Forks and Little Pilgrim SRMA would be the same as described in Alternative I. The Luds Point ERMA was part of the Salmon Falls Reservoir SRMA. Improvement of the route to Luds Point and a parking area would reduce future damage to sage-grouse habitat in this area. The other segments of the Salmon Falls Reservoir SRMA would be the similar to the Alternative I. Alternative VI would rank third most beneficial to special status wildlife. Potential impacts would be negligible to minor at the local scale and negligible at the landscape scale in both the short and long term.

Impacts from Transportation and Travel Actions

Routes and route density divide habitat, influence wildlife habitat use, and can be a source of wildlife mortality (Connelly et al., 2004; Lyon and Anderson, 2003; Walker et al., 2007a). Research has shown that sagebrush steppe birds can be affected by low levels of use on roads (1 to 12 vehicles per day; Lyon and Anderson, 2003; Gilbert and Chalfoun, 2011). Collisions with vehicles are also an occasional source of mortality to sage-grouse (Connelly et al., 2004). Brewer's and sage sparrows are displaced by roads and typically nest less frequently near roads than away from roads (Ingelfinger and Anderson, 2004). Ferruginous hawks are less disturbed by vehicles passing by on a road, compared to vehicles or humans that approach the nest (White and Thurow, 1985). In a geographic information system analysis of human-caused fires, Connelly and others (2004) reported human-caused fires are more frequent near roads and less frequent away from roads. Roads are high disturbance corridors that promote invasion and expansion of invasive annuals (Manier et al., 2011; Gelbard and Belnap, 2003).

New roads, whether created for wildland fire suppression, administrative purposes, land use authorizations, or other land uses, affect a larger area than the physically disturbed site. Brewer's sparrow

and sage sparrow nesting are substantially reduced for at least 330 feet on either side of the road (Ingelfinger and Anderson, 2004). Roads also delay sage-grouse nesting and reduce use of suitable habitat (Lyon and Anderson, 2003). In a leasable mineral development in Wyoming, Holloran (2005) concluded that leks within 1.8 miles (3 km) of roads were negatively influenced by roads. New routes would facilitate access to areas which currently receive little human use.

New or improved access roads leading to bighorn sheep habitat could result in increased human activity. Although some bighorn sheep habituate to some human activities (Keller and Bender, 2007; Leslie Jr. and Douglas, 1980; Papouchis et al., 2001), even habituated bighorn sheep can be displaced by increased human activities (Keller and Bender, 2007; Papouchis et al., 2001).

Table 4-169. Allocations and Change in Route Density Based on Travel Management Area Focus by Alternative

Area Classification	Alternative						
	No Action	I	II	III	IV	V	VI
Closed motorized (acres)	3,000	54,000	2,000	3,000	38,000	106,000	3,000
Closed mechanical and motorized (acres)	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Open (acres)	557,000	4,000	0	4,000	4,000	1,000	4,000
Limited to routes (acres)	751,000	1,253,000	1,309,000	1,304,000	1,269,000	1,204,000	1,304,000
TMA Route Changes							
Route increase (acres)	NA	41,000	1,158,000	34,000	34,000	3,000	35,000
Route static (acres)	NA	667,000	213,000	1,337,000	0	0	1,201,000
Route decrease (acres)	NA	663,000	0	0	1,337,000	1,368,000	135,000

The following indicator was used to evaluate impacts from Transportation and Travel actions to special status wildlife species:

- Acres with special management emphasis (areas open, closed, or limited; Travel Management Area [TMA] focus).

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, routes would continue to increase from cross-country motorized vehicle use in open areas (Twin Falls; Elmore; and Elko Counties allocated as open). The portion of Owyhee County within the planning area would remain limited to existing routes, which should limit future route expansion due to motorized vehicle use for hunting, sight-seeing, camping or other forms of recreation. However, new routes could be constructed or existing routes upgraded in conjunction with land use authorizations or other land uses in both open and limited areas. Route density and human disturbance would increase. Increased route density and human disturbance would be negligible to minor at the local scale in the short term and minor in the long term at the planning area scale. Designated Wilderness has 60,000 acres closed to motorized or mechanical vehicles, which would maintain low route density and human disturbance. Low route density and human disturbance in the wilderness and Wilderness Study Area would be negligible at the local and planning area scale in the short and long term.

The No Action Alternative would continue to have 342,000 acres classified as open, whereas, 63,000 acres are closed. Open areas have 14 occupied sage-grouse leks, 95,000 acres of key sage-grouse habitat, 3,000 acres of bighorn sheep habitat, and five spotted frog streams. Closed areas have six

occupied sage-grouse leks, 19,000 acres of key sage-grouse habitat, and 30,000 acres of bighorn sheep habitat. Limited areas have 71 occupied sage-grouse leks, 197,000 acres of key sage-grouse habitat, and 16,000 acres of bighorn sheep habitat. The 1987 Jarbidge RMP does not have much other direction for transportation and travel other than not improving routes which lead to bighorn sheep habitat in the Bruneau-Jarbidge Area of Critical Environmental Concern. There would continue to be no TMAs in the No Action Alternative. Transportation and travel in the No Action Alternative would be the least beneficial with minor to moderate adverse impacts to special status wildlife at the landscape scale.

Impacts from Management Specific to Alternative I

The Canyonland, Jarbidge Foothills and Snake River TMAs would focus on reducing route density. These TMAs have 43 occupied sage-grouse leks, 162,000 acres of key sage-grouse habitat, and 49,000 acres of bighorn sheep habitat. Route density in watersheds containing spotted frog would likely decrease. Route density in these TMAs would decline. The creation of new routes for wildland fire suppression, land use authorizations, or resource uses would off-set some of the density reduction. Improving existing primitive roads or creating new roads would likely increase human disturbance in those areas. The Deadman/Yahoo TMA (41,000 acres), in which route density increases, lacks sage-grouse leks, key sage-grouse habitat, bighorn sheep habitat, and spotted frog habitat. The Devil Creek TMA, which would maintain route density and human disturbance, contains no bighorn sheep habitat, 146,000 acres of key sage-grouse habitat, and 48 occupied sage-grouse leks. Like the No Action Alternative the closed areas would retain low levels of routes and human disturbance.

Seasonal route closures, particularly winter through spring, would reduce potential impacts on sage-grouse or bighorn sheep. Improving routes in or adjacent to habitat bighorn sheep habitat would facilitate human access. Although areas with increased human use may displace bighorn sheep from some areas (Papouchis et al., 2001); the minor increases in use would not result in habitat abandonment.

Granting exceptions to lease, right-of-way (ROW), or permit holders for cross-country motorized vehicle use would maintain use of undesignated routes. Creation of new routes would be associated with some types of new infrastructure. Continued use of many primitive roads and trails, as well as cross-country motorized vehicle use by permit holders, would off-set declines in route density.

Approximately 4,000 acres would be open to motorized cross-county travel. The open area contains no sage-grouse leks, key sage-grouse habitat, or bighorn sheep habitat. Areas closed to motorized vehicle use would have 14 occupied sage-grouse leks, 42,000 acres of key sage-grouse habitat, and 43,000 acres of bighorn sheep habitat. The limited area (1,253,000 acres) would have 77 occupied sage-grouse leks, 269,000 acres of key sage-grouse habitat, and 5,000 acres of bighorn sheep habitat. The area limited to designated routes would help maintain habitat and habitat patch size for special status wildlife. The impacts of Alternative I would be minor and beneficial at the local scale and negligible at the planning area scale in the short and long term. Alternative I would rank third most beneficial for with minor impacts to special status wildlife.

Impacts from Management Specific to Alternative II

The closed area would have same amount of occupied sage-grouse leks, key sage-grouse habitat, and bighorn sheep habitat as the No Action Alternative. Route density would remain static in the Canyonlands TMA. Approximately 49,000 acres of bighorn sheep habitat, 67,000 acres of key sage-grouse habitat and 25 occupied sage-grouse leks would be present in this TMA. Route density would increase in the Bruneau Desert TMA to facilitate resource uses. Approximately 244,000 acres of key sage-grouse habitat and 65 occupied sage-grouse leks would be present in the Bruneau Desert TMA. Route density in watersheds with spotted frog would likely increase. The increase of routes and access would be minor to major at the local scale depending on size and extent of future developments in the short and long term. At the planning area scale increases in route density would be minor to moderate depending on the extent of new infrastructure. As in Alternative I, lease, permit, and ROW holders could get exceptions to motorized vehicle restrictions; the effects would be similar to those described for Alternative I.

Only 62,000 acres would be closed to motorized and mechanized use entirely within wilderness and the Wilderness Study Area. No acreage would be open to cross-country motorized vehicle use, sage-grouse

or bighorn sheep habitat would be absent in this area. The limited area (1,309,000 acres) would have 19,000 acres of bighorn sheep habitat and 292,000 acres of key sage-grouse habitat with 85 occupied sage-grouse leks. The Bruneau Desert TMA would be managed to increase route density to facilitate resource uses and wildland fire suppression. Depending on the location and amount of new routes, Adverse impacts would be minor to major at the local scale and minor to moderate at the planning area scale. Alternative II would be tied for Alternative III as fifth least beneficial with moderate adverse impacts to special status wildlife due to no TMAs have a reduce route density.

Impacts from Management Specific to Alternative III

Route density would increase in the Deadman/Yahoo TMA (34,000 acres) which is in the same area but 7,000 acres smaller. The reduced area could result in higher route density within the 34,000 acres, compared to route density on 41,000 acres. Human disturbance would be more concentrated in a reduced area in this TMA. For the remaining 864,000 acres route density would remain similar to current conditions. Increases in new routes would be off-set by closing some routes. TMAs in Alternative III focus on improving access for wildland fire suppression and other administrative purposes. Improved routes would encourage use in areas that previously received little use. Closures of some designated routes to the public during periods of excessive fire danger would reduce the chance of human-caused fires burning special status species habitat. As in Alternative I, lease, permit, and ROW holders could get authorizations allowing exceptions to motorized vehicle restrictions; the effects would be similar to those described for Alternative I. Route density and human disturbance would likely be less than Alternative II due to the majority of the TMAs managing to keep route density static. Effects of granting ROW or permit holders exemptions for cross-country travel would be the same as Alternative I. Adverse impacts of route density would be minor to moderate at the local scale and minor at the planning area scale.

None of the remaining TMAs have an objective to reduce route density. Acres closed to motorized vehicles and motorized/mechanized would be the same as Alternative I with the same impacts. The Deadman/Yahoo TMA (34,000 acres) would focus on motorized use with an objective to increase routes. However, no sage-grouse, bighorn sheep, or spotted frog habitat lies within this TMA. Alternative III would be tied for Alternative II as fifth least beneficial to special status wildlife, no TMAs with decreasing route density.

Impacts from Management Specific to Alternative IV

Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs have a focus on increasing habitat core size in Alternative IV. To increase habitat core size fewer routes would be designated in these TMAs. Route density would be reduced on roughly 1,016,000 acres in sage-grouse and sharp-tailed grouse, bighorn sheep and spotted frog habitat. Like Alternative I seasonal or time of day limitations in some areas may further mitigate impacts to special status wildlife during important periods. Impacts from exemptions to lease, permit, and ROW holders for motorized vehicle cross-country travel would be the same as Alternative I. Deadman/Yahoo TMA (34,000 acres) would have increased route density with impacts similar to Alternative I.

Acres closed to motorized vehicles would increase from 3,000 acres to 38,000 acres. The same 60,000 acres would remain closed to motorized and mechanized vehicles as in Alternative I. The closed areas would encompass 14 occupied sage-grouse leks, 50,000 acres of key sage-grouse habitat, and 30,000 acres of bighorn sheep habitat. Effects would be similar to Alternative I, but a little less bighorn sheep habitat would be protected. Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs would focus on increasing habitat core size in Alternative IV. The area limited to designated routes (1,337,000 acres) would contain over 300,000 acres of key sage-grouse habitat and 91 occupied sage-grouse leks. Open areas would remain the same as in Alternative I with the same impacts. Alternative IV would be second most beneficial minor to moderate effects for special status wildlife at the landscape scale.

Impacts from Management Specific to Alternative V

Route density would increase in the Yahoo TMA. Route density in the remaining four TMAs (1,368,000 acres) would be reduced, lessening human disturbance to special status wildlife. No new roads would be constructed for wildland fire suppression or other administrative purposes, but some existing primitive roads would be improved to facilitate wildland fire access. Because other uses are more restricted, fewer

new routes would be created. Because lease, permit, or ROW holders would not be exempted, fewer new routes would be created and non-designated trails and primitive roads would recover over time.

The open area in Alternative V decreases to 1,000 acres, which contains no bighorn sheep, spotted frog, key sage-grouse habitat, or sage-grouse leks. The area closed to motorized and mechanized vehicles would remain the same as Alternative I with the same impacts. The Canyonlands, Devil Creek, Jarbidge Foothills and Snake River TMAs all have the objective of reducing route density. The area closed to motorized vehicles would increase to 106,000 acres which would encompass 84,000 acres of key sage-grouse habitat, 22 occupied sage-grouse leks, 43,000 acres of bighorn sheep habitat, and all spotted frog streams. Alternative V would be the most beneficial to special status wildlife with moderate impacts at the landscape scale.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Route density would increase in the Deadman/Yahoo TMA (35,000 acres) used primarily for motorized recreation. Route density would be maintained in three TMAs (1,202,000 acres). However road improvement would likely increase human disturbance. Routes would decrease in one TMA (135,000 acres), but improved roads would likely increase human disturbance. Like Alternative I, lease, permit, and ROW holders would be granted travel exemptions with the same impacts.

Areas open would be the same as in Alternative I with the same impacts. The acreage closed to motorized and mechanized vehicle use would be same as Alternative III. Only the Jarbidge Foothills TMAs would have a focus of increasing core habitat size (135,000 acres) or decreasing routes which would increase habitat patch size and decrease disturbance in the long term. Canyonlands, Devil Creek and Snake River TMAs would maintain the current route density (905,000 acres). Overall Alternative VI would rank fourth of the alternatives. Beneficial impacts to special status wildlife would be minor at the landscape scale.

Impacts from Land Use Authorization Actions

Land use authorizations that result in increasing route density and infrastructure (e.g., roads, towers, powerlines, wind turbines, buildings) contribute to direct habitat loss, disturbance, and mortality for special status wildlife species (Arnett et al., 2007; Arnett et al., 2008; Connelly et al., 2004; Kuvlesky Jr. et al., 2007; Walker et al., 2007a). Connelly and others (2004) modeled the influence of transmission lines and roads on sage-grouse habitat at approximately 0.3 miles (Connelly et al., 2004). Johnson and others (2011) reported in their landscape analyses secondary roads and power lines had no apparent effect on sage-grouse lek persistence long term. However, they qualified this finding by stating “effects of some anthropogenic features may have already been manifested before our study period and thus not have been detected in this analysis.”

The majority of the land use authorizations would continue to be small and usually linear authorizations (e.g. short roads, local power distribution lines or water pipelines) would cross BLM land between private land or small areas (communications sites). A few land use authorizations are potentially large such as: road right-of-way (ROW) width increases, new lines in utility ROW corridors, and renewable energy projects. Buried infrastructure would have less impact to sage- grouse than above ground structures (e.g., towers, transmission lines) due to mortality from collisions (Connelly et al., 2004) or increased nest predation due to nesting ravens (Bui et al., 2010; Steenhof et al., 1993), or raptors (Steenhof et al., 1993). Overlapping land use authorizations such as burying cable within road ROWs can reduce effects to habitat. Table 4-170 displays special status wildlife habitat categories and habitat within the designated utility ROW corridors.

Table 4-170. Special Status Wildlife Habitat in Right-of-Way Corridors by Corridor

	Pilgrim Gulch	Shoestring	Balanced Rock	Saylor Creek	Jarbidge Nevada	Roseworth	Oil/Gas Pipelines
Total acres in corridor	3,800	4,500	9,700	11,000	24,000	2,300	11,000
Wildlife Group Habitat							
Aspen (acres)	0	0	0	0	0	0	0
Canyonland (acres)	0	0	0	0	1,000	200	0
Duneland (acres)	0	0	0	14	0	0	0
Grassland (acres)	3,800	4,500	8,000	10,000	19,000	400	11,000
Mountain Mahogany/ Mountain Shrub (acres)	0	0	0	0	< 10	0	0
Sagebrush Steppe (acres)	0	0	1,500	500	4,700	1,500	300
Riparian/Perennial stream (miles)	0	1	1	0	6	2	2
Habitat Components							
Key sage-grouse habitat (acres)	0	0	0	0	4,700	1,500	0
Sage-grouse Leks (occupied)	0	0	0	0	1	0	0
Sage-grouse leks (other)	0	0	0	0	2	1	0
Sage-grouse leks (unoccupied)	0	0	0	0	1	0	0
Sharp-tailed grouse leks (occupied)	0	0	0	0	0	0	0
Ferruginous hawk (nest sites)	0	0	0	0	2	0	0
Lewis's woodpecker (sites)	0	0	0	0	1	0	0
Prairie falcon (nest sites)	0	0	0	0	0	0	0
Pygmy rabbit (sites)	0	0	0	0	1	0	0
Bighorn sheep habitat (acres)	0	0	0	0	1,000	0	0
Spotted frog (streams)	0	0	0	0	0	0	0
Bruneau Dunes tiger beetle habitat (acres)	0	0	0	14	0	0	0

The following indicators were used to analyze impacts from Land Use Authorizations actions on special status wildlife species:

- Acres with special management emphasis (avoidance, exclusion, and available areas) and
- Change in distribution or numbers of special status wildlife.

Impacts from Management Specific to the No Action Alternative

ROW exclusion areas (62,000 acres) would not be impacted by any ROWs. The majority of the exclusion area is designated wilderness and areas within the Wilderness Study Area. Within this area (approximately 62,000 acres) no land use authorizations would be allowed. Within the exclusion area is 30,000 acres of bighorn sheep habitat, 19,000 acres of key sage-grouse habitat, seven occupied sage-grouse leks and habitat for prairie falcon and spotted bat. Beneficial impacts of the ROW exclusion area would be minor in the long term at the landscape scale.

The No Action Alternative has 935,000 acres of avoidance and 388,000 acres of available areas. The vast majority of the avoidance area is due to a large military operating area. Some infrastructure may be authorized in the avoidance area if the project meets the avoidance stipulations. The majority of ROWs in the avoidance area would likely be surface (roads) or subsurface such as buried pipeline or fiber optic cable. ROW issued in the available area may include transmission lines, radio or cell towers and other tall structures. New ROWs may follow existing routes or result in new disturbances. Adverse impacts would be minor locally and negligible to minor at the landscape scale in the long term. Four utility ROW corridors (Pilgrim Gulch, Shoestring, Balanced Rock, and Saylor Creek) would be designated covering approximately 30,000 acres. The existing utility corridors run through the northern portion of the planning area and would be common to all alternatives. Because of wildland fires, the corridors include approximately 27,000 acres of grassland and 2,000 of sagebrush steppe habitat. None of the corridors in the No Action Alternative have aspen, canyonland, or mountain mahogany/mountain shrub habitats. All the corridors are dominated by grassland habitat. The Balanced Rock and Saylor Creek utility ROW corridors have small scattered islands of sagebrush steppe habitat. Brewer's sparrows have been observed at some of the sagebrush islands. The nearest active sage-grouse lek is approximately seven miles away from any of the corridors in the No Action Alternative. No bighorn sheep or key sage-grouse habitat would be within the corridors in this alternative. The Saylor Creek Corridor would include less than 20 acres of the tiger beetle habitat. The Shoestring corridor crosses habitat occupied by western toad. Piute ground squirrels are widely distributed in the planning area and occur in all utility ROW corridors. Prairie falcon and ferruginous hawks are widespread but no active nests have been documented in the existing utility corridors. Spotted and Townsend's big eared bats have a patchy distribution and occur at low densities. No spotted or Townsends's big-eared bats have been documented in the existing utility corridors.

Additional transmission lines in the designated utility ROW corridors would increase infrastructure density (towers, routes, etc.). Towers and lines provide raptors and ravens additional hunting perches. Depending on the tower configuration ferruginous hawks may construct nests on some structures. Additional transmission lines would require additional disturbance during construction and for maintenance. At this time there is no infrastructure in or adjacent to tiger beetle habitat. It is unknown whether avian predation on adult tiger beetles would increase as a result of birds perching on lines or structures. The No Action Alternative provides no direction for ROWs to be placed in existing disturbed areas when practical which increases infrastructure density. Current policy directs companies to co-locate at communications sites, which reduces some infrastructure. For most small land use authorizations impacts would be negligible to minor at the local scale and negligible at the planning area scale in the short and long term. Impacts of large projects would vary with location and size. They could be moderate to major at the local scale short and long term and minor to major at the planning area scale short and long term.

The area where expected wind energy development would likely occur has wind resources that are marginal or higher, totaling 111,000 acres in the planning area. The No Action Alternative contains about 49,000 acres of key sage-grouse habitat in the expected wind energy development area which is the second most behind Alternative II. In the northern portion of the planning area, sage-grouse are generally absent due to large wildland fires. Renewable energy development in this area would have minimal impacts to sage-grouse and their habitat. The wind resource is best in the China Mountain/Browns Bench area. This area has several special status wildlife species (prairie falcon, sharp-tailed grouse, Lewis's woodpecker, spotted frog, etc.). Radio telemetry data shows the area is important to sage-grouse, linking northern Nevada and areas east and west of Salmon Falls Creek. Zones of influence of specific tall structures on sage-grouse are uncertain; however, Connelly and others (2000) recommended that tall structures that provide perches for raptors should be not be placed within two miles (3.2 km) of important

seasonal sage-grouse habitat, irrespective of lek location. If sage-grouse respond to wind energy development similar to disturbance and infrastructure associated with coal bed methane and oil/gas development (Holloran , 2005; Naugle et al., 2011) sage-grouse would likely be displaced from an area substantially larger (two to four miles) than the project footprint over time. Mortality of special status species may increase locally. For most special status wildlife (Piute ground squirrel, Brewer's sparrow, prairie falcon, etc.) impacts would likely be negligible to minor at the local scale. However, impacts could be higher for spotted bats which occur at low population density and in disjunct sub-populations (Luce et al., 2004) or for sage-grouse (Connelly et al., 2004). For these species large projects may have moderate to major impacts at the local scale and minor to major impacts at the planning area scale in the long term depending on location, size, and type of land use authorization. Wind energy developments and other land use authorizations are expected to create new routes or substantially improve existing to areas that presently receive low levels of human use. Depending on project size and location, long-term adverse impacts would range from minor to major at the local and landscape scales in the long term.

The No Action Alternative would provide the least area for ROW exclusion and ROW avoidance and most area of expected wind energy development, The No Action Alternative would rank second least beneficial to special status wildlife.

Table 4-171. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for the No Action Alternative

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	983,000	62,000	388,000	30,000	111,000
Bighorn sheep habitat (acres)	19,000	30,000	0	0	0
Key sage-grouse habitat (acres)	167,000	19,000	125,000	0	49,000
Sage-grouse leks (occupied)	56	6	29	0	32
Sage-grouse leks (other)	66	0	25	0	7
Sage-grouse leks (unoccupied)	19	1	6	0	2
Sharp-tailed grouse leks (occupied)	1	0	1	0	0
Ferruginous hawk (nest sites)	33	1	27	2	0
Lewis's woodpecker (sites)	17	1	10	1	13
Prairie falcon (nest sites)	7	0	20	0	2
Pygmy rabbit (sites)	44	0	21	1	2
Spotted frog (streams)	1	0	4	0	5
Riparian/perennial stream (miles)	144	104	69	2	0
Bruneau Dunes tiger beetle (acres)	700	0	15	14	0

Impacts from Management Specific to Alternative I

In Alternative I the ROW exclusion area would be increased by 1,000 acres than the No Action Alternative to 63,000 acres of which about 30% is key sage-grouse habitat and nearly half is bighorn habitat. Adverse impacts to special status species habitat in this area would not occur due to land use authorizations. Beneficial impacts of the ROW exclusion area would be minor in the long term at the landscape scale.

The avoidance area totals 1,001,000 acres in Alternative I. Impacts of the Jarbidge Corridor on bighorn sheep, Brewer's sparrow, sage sparrow, and Piute ground squirrel would be negligible at the local and planning area scale, both short and long term, due to their limited use of the area. Adverse impacts of additional transmission lines and associated roads in the Jarbidge Nevada Corridor on sagebrush-obligate special status species and their habitat would be considered minor to moderate at the local scale and minor at the planning area scale.

Alternative I would include the same four utility ROW corridors as the No Action Alternative and would add the Jarbidge Nevada corridor and increase the acreage to 53,000 acres. The Jarbidge Nevada corridor includes 3,700 acres of key sage-grouse habitat and 1,000 acres of bighorn sheep habitat south of Murphy Hot Springs. Bighorn sheep are infrequently observed in the area. This corridor would cross the East Fork of the Jarbidge River, Clover and Salmon Falls Creeks totaling about one mile of riparian habitat. A power line consisting of wooden poles is currently in place. All structures (power poles) are on or near the plateau and no roads for the power line directly influence riparian habitat. Additional transmission lines in the existing corridors would increase infrastructure density, providing additional perching and nesting habitat for ferruginous hawks, prairie falcon, and ravens. Power lines and guy wires pose a collision hazard for sage-grouse, ferruginous hawk and prairie falcon when visibility is poor. Roads and infrastructure in areas with poor wind potential could reduce sage-grouse use of these areas as well as areas where the wind resource is higher. Wind energy would be restricted from China Mountain and Browns Bench in this alternative precluding an increase in tall infrastructure in this area.

Approximately 39,000 acres are rated with a wind potential as marginal or higher in expected wind development areas. About 3,400 acres of key sage-grouse habitat lies within the expected wind energy areas. Renewable energy development could have minor to major adverse impacts at the local scale depending on location and extent and size of the project. The buffer distance around leks would vary from one to three miles depending on topographic screening.

Table 4-172. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for Alternative I

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	1,001,000	63,000	369,000	53,000	39,000
Bighorn sheep habitat (acres)	19,000	30,000	0	1,000	0
Key sage-grouse habitat (acres)	167,000	19,000	125,000	5,000	3,400
Sage-grouse leks (occupied)	56	6	29	1	2
Sage-grouse leks (other)	66	0	25	2	0
Sage-grouse leks (unoccupied)	19	1	6	1	0
Sharp-tailed grouse leks (occupied)	1	0	1	0	0
Ferruginous hawk (nest sites)	33	1	27	2	0
Lewis's woodpecker (sites)	7	0	20	1	0
Prairie falcon (nest sites)	17	1	10	0	1
Pygmy rabbit (sites)	44	0	21	1	0
Spotted frog (streams)	1	0	4	0	5
Riparian/perennial stream (miles)	142	107	69	9	9
Bruneau Dunes tiger beetle (acres)	700	0	15	700	0

Alternative I would be fourth least beneficial for maintaining special status wildlife and their habitat. Potential adverse impacts would be minor to moderate at the landscape scale in the long term.

Impacts from Management Specific to Alternative II

The ROW exclusion area would be the same size as the No Action Alternative (62,000 acres) with the same impacts.

The avoidance area and utility ROW corridors would remain the same as Alternative I, however, the development focus may increase the amount of future infrastructure. The number of occupied sage-grouse leks and key habitat would within exclusion and avoidance areas would be the same as Alternative I. Alternative II has a one mile avoidance area for tall structures near grouse leks.

About 127,000 acres would be present within the expected wind energy development areas. Key sage-grouse habitat would occupy a little over 46% of the expected wind development area. Wind energy development in the southwestern portion of the planning area could result in bighorn sheep displacement in and near the Bruneau Canyon. The change in special status species distribution in the south eastern would be similar to the No Action Alternative. Impacts to sage-grouse distribution would be similar to but increased compared to the No Action Alternative. Adverse impacts would be minor to major at the local scale and minor to major at the planning area scale depending on the location, size, and type of project.

Table 4-173. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for Alternative II

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	1,001,000	62,000	370,000	53,000	127,000
Bighorn sheep habitat (acres)	19,000	30,000	0	1,000	0
Key sage-grouse habitat (acres)	167,000	19,000	125,000	5,000	59,000
Sage-grouse leks (occupied)	56	6	29	1	13
Sage-grouse leks (other)	66	0	25	2	9
Sage-grouse leks (unoccupied)	19	1	6	1	3
Sharp-tailed grouse leks (occupied)	1	0	1	0	0
Ferruginous hawk (nest sites)	33	1	27	2	0
Lewis's woodpecker (sites)	7	0	20	1	20
Prairie falcon (nest sites)	17	1	10	0	4
Pygmy rabbit (sites)	44	0	21	1	3
Spotted frog (streams)	1	0	4	0	5
Riparian/perennial stream (miles)	144	104	69	9	63
Bruneau Dunes tiger beetle (acres)	700	0	15	700	0

Alternative II would be least beneficial for maintaining special status wildlife. Potential adverse impacts would be moderate to major in the long term at the landscape scale.

Impacts from Management Specific to Alternative III

The exclusion area, avoidance area and utility ROW corridors would be the same as Alternative I with the same impacts.

A three mile lek buffer would minimize tall infrastructure density increases near sage-grouse leks and subsequent displacement of sage-grouse. Wind energy development on Browns Bench and north toward Antelope Pocket would increase infrastructure density in key sage-grouse habitat. Displacement and disturbance of Alternative III would have adverse negligible to major impacts at the local scale and negligible to moderate at the planning area scale depending on the location, size, and type of project.

However Alternative III includes 7,000 acres more of key sage-grouse habitat with two additional occupied sage-grouse leks in the expected wind energy development area compared to Alternative I. Within the expected wind energy development key sage-grouse habitat would likely be reduced due to access routes for turbine construction and maintenance and power lines connecting turbine strings or other facilities. The distance from leks for tall structures would be a fixed three miles rather than a variable one to three miles as described in Alternative I. Similar to Alternative I, Alternative III adverse impacts would be minor to major at the local scale.

Table 4-174. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for Alternative III

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	1,001,000	63,000	369,000	53,000	50,000
Bighorn sheep habitat (acres)	19,000	30,000	0	1,000	0
Key sage-grouse habitat (acres)	167,000	19,000	125,000	5,000	11,000
Sage-grouse leks (occupied)	56	6	29	1	4
Sage-grouse leks (other)	66	0	25	2	2
Sage-grouse leks (unoccupied)	19	1	6	1	1
Sharp-tailed grouse leks (occupied)	1	0	1	0	0
Ferruginous hawk (nest sites)	33	1	27	2	0
Lewis's woodpecker (sites)	7	0	20	1	0
Prairie falcon (nest sites)	17	1	10	0	1
Pygmy rabbit (sites)	44	0	21	1	3
Spotted frog (streams)	1	0	4	0	5
Riparian/perennial stream (miles)	142	107	69	9	9
Bruneau Dunes tiger beetle (acres)	700	0	15	700	0

Alternative III would be third least beneficial for maintaining wildlife and wildlife habitat. In the long term, potential adverse impacts would be moderate at the landscape scale in the long term.

Impacts from Management Specific to Alternative IV

Alternative IV would have the second largest (nearly 100,000 acres) ROW exclusion area, 60% greater than the No Action Alternative. Beneficial impacts would be minor to moderate at the landscape scale over the long term.

The ROW avoidance area and utility corridor areas would be the same as Alternative I with the same impacts.

The expected wind development area would be third smallest of the alternatives. Key sag-grouse habitat would occupy approximately 200 acres of the area. Adverse impacts within the expected wind energy area would include habitat loss habitat fragmentation due to an increase in infrastructure. Alternative IV would require that tall structures be located more than five miles from occupied sage-grouse leks, which is two miles farther than Alternatives I and III. This is consistent with recommendations in the 2006 Conservation Plan for the Greater Sage-grouse in Idaho. Minimizing infrastructure within 5 miles of sage-grouse leks would reduce future displacement of sage-grouse leks.

Management direction in Alternative IV would reduce most displacement impacts to BLM special status wildlife. Adverse impacts at the local scale would be negligible to moderate depending on project size and location in the short and long term. Adverse effects would likely be negligible to minor at the planning area scale in the short and long term.

Table 4-175. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for Alternative IV

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	1,001,000	100,000	335,000	53,000	37,000
Bighorn sheep habitat (acres)	19,000	30,000	0	1,000	0
Key sage-grouse habitat (acres)	166,000	50,000	95,000	5,000	200
Sage-grouse leks (occupied)	56	14	21	1	2

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Sage-grouse leks (other)	66	5	20	2	0
Sage-grouse leks (unoccupied)	19	1	6	1	1
Sharp-tailed grouse leks (occupied)	1	0	1	0	0
Ferruginous hawk (nest sites)	33	1	27	2	0
Lewis's woodpecker (sites)	7	1	19	1	0
Prairie falcon (nest sites)	15	4	9	0	1
Pygmy rabbit (sites)	44	3	18	1	1
Spotted frog (streams)	5	0	0	0	0
Riparian/perennial stream (miles)	133	125	60	9	9
Bruneau Dunes tiger beetle (acres)	700	0	15	700	0

Alternative IV would be third most beneficial for maintaining special status wildlife habitat. In the long term, adverse impacts would be minor to moderate at the landscape scale.

Impacts from Management Specific to Alternative V

The ROW exclusion area would be largest (167,000 acres) of all the alternatives. Beneficial impacts of the increased ROW exclusion area would be minor to moderate in the long term at the landscape scale. Alternative V has the second largest (1,227,000 acres) avoidance area of the alternative only being smaller than those in Alternative VI. Utility ROW corridors would be the same as Alternative I with the same adverse localized impacts.

Alternative V has the second smallest area available for expected wind energy development and would essentially prohibit wind energy development in the southern part of the planning area. No key sage-grouse habitat would be present within the expected wind development area. Because future wind development would be targeted to the northern portion of the planning area, any adverse impacts to special status wildlife in the aspen, mountain mahogany/mountain shrub and sagebrush steppe be avoided,

Similar to Alternative IV the five mile buffer around occupied leks would minimize an increase in tall infrastructure within the buffer distance. As a result Alternative V would help maintain a low density of tall structures in sage-grouse habitat similar to Alternative IV.

Alternative V would minimize changes in special status wildlife distribution due to land use authorizations. Adverse impacts at the local scale would be negligible to moderate depending on project size and location in the short and long term. Beneficial effects would likely be negligible to minor at the planning area scale in the long term. Alternative V would be second most beneficial for special status wildlife and their habitats.

Table 4-176. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for Alternative V

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	1,227,000	167,000	144,000	53,000	31,000
Bighorn sheep habitat (acres)	5,000	44,000	0	1,000	0
Key sage-grouse habitat (acres)	227,000	84,000	200	5,000	0
Sage-grouse leks occupied)	69	22	29	1	0
Sage-grouse leks (other)	84	7	0	2	0
Sage-grouse leks (unoccupied)	25	1	0	1	0

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Sharp-tailed grouse leks (occupied)	2	0	0	0	0
Ferruginous hawk (nest sites)	57	1	3	2	0
Lewis's woodpecker (sites)	26	1	0	1	0
Prairie falcon (nest sites)	22	4	2	0	1
Pygmy rabbit (sites)	62	3	0	1	0
Spotted frog (streams)	5	0	0	0	2
Riparian/perennial stream (miles)	148	148	22	9	9
Bruneau Dunes tiger beetle (acres)	700	0	15	700	0

Impacts from Management Specific to Alternative VI (Proposed RMP)

The ROW exclusion area would be reduced to 63,000 acres like Alternatives I and III with the same impacts.

Alternative VI would have the largest ROW avoidance area (1,234,000 acres) limiting tall infrastructure over the vast majority of sage-grouse habitat.

Alternative VI would not include the Jarbidge Nevada utility ROW corridor, but adds the Roseworth and Oil and Gas Pipeline Corridors. The Roseworth Corridor would cross Salmon Falls Creek near Lilly Grade. Most of this route would be through key sage-grouse habitat (1,700 acres). Overall there would be a decrease in acreage and less sage-grouse habitat in utility ROW corridors compared to Alternatives I, II, III, IV, and V. The sage-grouse lek buffer distance would be four miles or a mile greater than Alternative III but less than Alternatives IV and V.

The expected wind development area would be the smallest of all the alternatives. Wind energy development would occur in grassland areas previously burned by wildland fires. Development would lead to minor to moderate habitat loss and fragmentation at the local scale in the long term. Impacts of development in this area to special status wildlife would be minor at the landscape scale. Development of wind energy in the northern part of the planning area would have negligible impact on most special status wildlife due to limited habitat in the area. Wind energy would be prohibited from the southeastern portion of the planning area. The change in special status species distribution would be similar to Alternative V. Potential adverse impacts at the local scale would be negligible to moderate depending on project size and location in the short and long term. Beneficial effects would likely be minor at the planning area scale.

Alternative VI would have the most acreage of ROW avoidance, second to the least ROW exclusion area, second least utility corridor area and least acreage of expected wind development area. Alternative VI would be the most beneficial for maintaining special status wildlife habitat in the long term. Benefits would be minor at the landscape scale.

Table 4-177. Selected Special Status Wildlife Habitat Components in Land Use Authorization Areas for Alternative VI (Proposed RMP)

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Total (acres)	1,232,000	63,000	139,000	43,000	22,000
Bighorn sheep habitat (acres)	19,000	30,000	0	0	0
Key sage-grouse habitat (acres)	290,000	19,000	2,000	2,000	0
Sage-grouse leks (occupied)	85	6	0	0	1
Sage-grouse leks (other)	91	0	0	1	0
Sage-grouse leks (unoccupied)	25	1	0	0	0

	Avoidance	Exclusion	Available	Utility ROW Corridors	Expected Wind Energy
Sharp-tailed grouse leks (occupied)	2	0	0	0	0
Ferruginous hawk (nest sites)	57	1	3	2	0
Lewis's woodpecker (sites)	27	0	0	1	0
Prairie falcon (nest sites)	25	1	2	0	1
Pygmy rabbit (sites)	65	0	0	1	0
Spotted frog (streams)	5	0	0	0	0
Riparian/perennial stream (miles)	190	106	21	6	16
Bruneau Dunes tiger beetle (acres)	700	0	15	<20	0

Impacts from Minerals Actions

Site specific environmental analysis would be completed prior to the exploration and development of mineral resources. Mineral development would increase infrastructure and human disturbance in areas open, and could alter habitat use (Connelly et al., 2004; Doherty et al., 2008; Holloran et al., 2005; Ingelfinger and Anderson, 2004; Walker et al., 2007a). Leasable, locatable, and salable minerals were analyzed as common to the No Action Alternative and all action alternatives because there was little difference between the alternatives. The Reasonably Foreseeable Development Scenarios for leasable minerals are the same for all alternatives. The probability for substantial development of locatable minerals is low, areas withdrawn are the same, and any future development would be the same across all alternatives. The change in salable minerals between alternatives is negligible at the landscape scale.

The following indicators were used to analyze impacts from Minerals actions on special status wildlife species:

- Acres with special management emphasis (open, open with constraints) and
- Change in distribution or numbers of special status wildlife.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Leasable Minerals

The analysis for leasable minerals was based primarily on the Reasonably Foreseeable Development Scenarios (RFDSs) for oil and gas and geothermal resources developed by the Idaho BLM State Office (Appendices K and L).

No producible oil or natural gas has been located to date in south central Idaho. Oil and gas is potentially present on 307,000 acres in two areas (China Mountain and Glenns Ferry). Based on the RFDS the analysis focuses on areas where there would be a higher likelihood of development rather than the entire planning area. Saline water or water contaminated with petroleum would either be re-injected (preferred disposal method) or placed in lined evaporation ponds. Several special status bat species are known to drink from man-made water sources. Oil reserve or sludge pits associated with well drilling can be mistaken for ponds, causing mortality to bats trying to drink from them (O'Shea et al., 2001). Toxins can accumulate in bats eating insects contaminated by waste water stored in ponds (Luce and Keinhath, 2007). Effects of increased bat mortality are believed to be minor for bat species that occur in high densities. However, the loss of adult bats that occur in low densities, such as spotted bat, has a great impact on local populations (Luce and Keinhath, 2007). Ponds would likely provide habitat for mosquitos increasing the incidence of West Nile virus increasing sage-grouse mortality.

Depending on the method used some new routes may be built for seismic testing. If seismic surveys indicate oil or gas is present, up to two miles of temporary roads would be constructed to transport and maintain equipment for exploration wells. Wilson (2011) reported seismic testing with vibroseis trucks resulted in damage to pygmy rabbit burrows if the testing occurred within about 80 feet. Wilson (2011)

recommended a 160 foot buffer distance from vibroseis vehicles to occupied pygmy rabbit burrows during testing to prevent collapse. Drill pads for exploration wells could be three to five acres in size. If a producible quantity of the resource is discovered additional wells would be drilled to establish the limits of the field. Well spacing could vary from 40 to several hundred acres per well. The oil and gas RFDS estimates roads, drill pads, pipelines, and storage tanks could total 60 to 90 acres for the entire field office over the life of the plan. The influence of gas-producing wells on sage-grouse leks extended to about 2.9 miles (4.7 km) (Holloran, 2005) or approximately 17,000 acres.

The increase of infrastructure density (roads, wells, pads, pumps, pipeline, etc.) for a small field would be moderate to major locally (developed field area) in both the short and long term for the China Mountain/Browns Bench Area. The impact of a similar small oil or gas field development would likely be minor to moderate at the local scale in the northern part of the planning area. Improved roads (existing and new) would increase human disturbance for the operation/maintenance of the field and the public. At the planning area scale oil and gas development in the Browns Bench area would be moderate whereas a similar development in the northern part of the planning area would be minor. The likelihood of a commercially viable oil or gas deposit being found is low.

The expected oil and gas area open or open with constraints varies by a total of 40,000 acres (266,000 to 306,000 acres). Key sage grouse habitat included within the expected open or open with constraints varies from a low of 40,000 acres to a high of 63,000 acres. The China Mountain area (95,000 acres) has about 63,000 acres key habitat whereas the Glenns Ferry area totals about 211,000 acres, but has very little key sage-grouse (200 acres) habitat.

Table 4-178. Selected Special Status Wildlife Habitat Components within Open and Open with Constraints in the Expected Oil and Gas Development Area

	Alternative					
	I	II	III	IV	V	VI
Open and Open with Constraints (acres)	295,000	306,000	301,000	272,000	266,000	301,000
Key sage-grouse habitat (acres)	63,000	64,000	63,000	40,000	63,000	63,000
Sage-grouse leks (occupied)	16	16	16	9	9	16
Sage-grouse leks (other)	13	13	13	8	8	13
Sage-grouse leks (unoccupied)	3	3	3	3	3	3
Sharp-tailed grouse leks (occupied)	1	1	1	1	1	1
Ferruginous hawk (nest sites)	2	2	2	2	2	2
Prairie falcon (nest sites)	7	9	7	6	6	7
Lewis's woodpecker (sites)	16	17	16	15	15	16
Pygmy rabbit (sites)	6	6	6	3	3	6
Bighorn sheep habitat (acres)	0	0	0	0	0	0
Spotted frog (streams)	4	4	4	4	4	4
Riparian/perennial streams (miles)	58	91	63	54	48	63
Bruneau Dunes tiger beetle (acres)	0	0	0	0	0	0

Indirect habitat impacts for sage sparrow and Brewer's sparrow nesting include reducing nesting density within 330 feet of the road (Ingelfinger and Anderson, 2004). For sage-grouse, vehicle traffic associated with roads reduces sage-grouse numbers at leks within 1.8 miles (3 km) (Holloran, 2005) and delays nesting (Lyon and Anderson, 2003). Even lightly used roads, 1 to 12 vehicles per day, appear to reduce sage-grouse nesting and result in female sage-grouse moving further to nest (Holloran, 2005). Areas with as five vehicles per day in a producing field still had suppressed numbers of Brewer's sparrows and sage sparrow near roads (Gilbert and Chalfoun, 2011). It is not known if a single five well field would result in the same impacts to sage-grouse, sage sparrow, and Brewer's sparrow as the Wyoming study which nearly 800 wells (Holloran, 2005). Leks did not appear to be impacted if the drilling occurred more than 3.8 miles (6.2 km) from leks (Holloran, 2005). Because female sage-grouse have strong nest site fidelity (Holloran and Anderson, 2005), impacts to sage-grouse nesting areas would not be realized for five to nine years after field development (Holloran, 2005). The influence of traffic from main haul roads on sage-

grouse leks ended at a distance of 3.75 miles (6.1 km) (Holloran, 2005). As road traffic increased in association with other gas field activities, sage-grouse attending leks within 1.8 miles (3 km) declined (Holloran, 2005). The influence of gas-producing wells on sage-grouse leks extended to about 2.9 miles (4.7 km) (Holloran, 2005). The RFDS indicated wells could be authorized at densities of 1 per 40 acres, a density that could exclude nesting by female sage-grouse (Holloran, 2005). Gilbert and Chalfoun (2011) reported impacts to songbirds remained even after active drilling and human disturbance declined. The development of a single five well field covering 180 acres (0.3 mile radius) would potentially influence sage-grouse use on 21,000 acres or more. Development of a single small field in the Browns Bench - China Mountain area would have greater impact to sage-grouse and spotted frog than the same development in the northern part of the planning area. The northern portion of the planning area has fewer special status wildlife species and less sagebrush steppe, mountain mahogany/mountain shrub or aspen habitats.

Geothermal resources have a greater potential for development in northwestern part of the planning area near the Bruneau Valley. Almost 9,000 acres of the planning area has geothermal resources rated as high potential but actual development would be on 185 to 230 acres. Another 356,000 acres is rated as having medium geothermal resources potential. The remaining 1,055,000 acres are low potential. About 300 acres of the high potential area are categorized as key sage-grouse habitat. In the medium potential area 1,700 acres are key habitat.

The RFDS for geothermal development estimates between 185 and 230 acres of surface disturbance would occur in the planning area as a result of geothermal exploration and development over the life of the plan. Approximately 85 acres would be disturbed during exploration. Drill pads for permanent wells, power plant, pipelines, roads and transmission lines could cover 100 to 145 acres. Based on the RFDS, the increase in infrastructure density associated with a geothermal development would be minor to moderate locally. Human disturbance would be moderate during construction and minor during operation. At the planning area scale the development would be minor in the short and long term.

The amount of high potential geothermal areas open or open with constraints varies from 5,000 to 8,000 acres or just over 0.4% of the planning area. The amount of moderate potential geothermal area open or open with constraints varies from 346,000 to 357,000 or just over 25% of the planning area. Approximately 2,000 acres of key sage-grouse habitat and two occupied sage-grouse leks lie within the high and moderate open and open with constraints expected geothermal area.

Table 4-179. Selected Special Status Wildlife Habitat Components within High and Medium Potential Open and Open with Constraints in the Expected Geothermal Development Areas

	Alternative					
	I	II	III	IV	V	VI
High Open and Open with Constraints (acres)	6,000	8,000	8,000	6,000	7,000	7,000
Medium Open and Open with Constraints (acres)	346,000	357,000	353,000	353,000	347,000	351,000
Key sage-grouse habitat (acres)	2,000	2,000	2,000	1,000	2,000	2,000
Sage-grouse leks (occupied)	2	2	2	2	2	2
Sage-grouse leks (other)	7	7	7	7	7	7
Sage-grouse leks (unoccupied)	2	2	2	2	2	2
Sharp-tailed grouse leks (occupied)	0	0	0	0	0	0
Ferruginous hawk (nest sites)	10	11	11	10	10	10
Prairie falcon (nest sites)	5	5	5	5	5	5
Lewis's woodpecker (sites)	1	1	1	1	1	1
Pygmy rabbit (sites)	2	2	2	2	2	2
Bighorn sheep habitat (acres)	0	0	0	0	0	0
Spotted frog (streams)	0	0	0	0	0	0
Riparian/perennial streams (miles)	18	43	24	25	18	25
Bruneau Dunes tiger beetle (acres)	700	700	700	700	700	700

Primarily due to the expected geothermal areas a change in special status wildlife would be minor at the local scale and negligible at the planning area scale in the short and long term.

Alternative IV-B has the largest area closed to leasable minerals followed by Alternatives IV-A, V, I, VI, III, and the least area closed to leasable minerals was Alternative II. Alternative VI has the largest area open with stipulations followed by Alternatives I, IV-B, IV-A, V, II, and III, respectively. Leasable mineral development would have minor to moderate adverse impacts to special status wildlife depending on location and extent of the development.

Locatable Minerals

Gold was mined in Jarbidge, Nevada in the early 1900s. There are a number of scattered locatable mineral claims in the planning area, but only one active mine (Jasper) occurs in the planning area. The disturbed area at the Jasper mine is approximately five acres. All alternatives include 60,000 acres (4% of the planning area) closed to locatable mineral development by statute or public land order. The majority of the withdrawn area is associated with the Bruneau and Jarbidge Rivers. Because of the difference in types of mining, unknown location of future mines and low probability of a large mine being developed all alternatives have the same analysis. A site specific analysis would be completed if a mine were to open.

The increase in infrastructure density and human disturbance would increase negligible to moderate at the local scale, with a larger mine resulting in more impacts than a small mine.

In the current withdrawn area, nearly 30,000 acres of bighorn sheep habitat, 19,000 acres of key sage-grouse habitat and six occupied sage-grouse leks are present. Total bighorn sheep habitat is 49,000 acres. Total key sage-grouse habitat is 311,000 acres and total occupied sage-grouse leks are 93. Spotted frogs have been periodically found in five streams. The vast majority of sage-grouse habitat in the planning area is open to locatable mineral exploration and development. The vast majority of habitat for Brewer's and sage sparrows, ferruginous hawk, Piute ground squirrel, prairie falcon, and pygmy rabbit would not be withdrawn. All sharp-tailed grouse, Lewis's woodpecker, and spotted frog habitats would remain open to locatable mineral exploration and development in the all alternatives.

Any change in the distribution of special status wildlife would depend on the mine location and proximity of habitats. Shifts in special status wildlife distribution would likely be minor at the local scale in both the short and long term. At the planning area scale any changes is distribution of special status wildlife would be negligible.

Table 4-180. Selected Special Status Wildlife Habitat Components in Areas Withdrawn and Recommended for Withdrawal from Locatable Mineral Development by Alternative

	Alternative						
	No Action	I	II	III	IV	V	VI
Recommended for Withdrawal (acres)	0	69,000	26,000	28,000	83,000	33,000	0
Total Withdrawn and Recommended (acres)	60,000	129,000	87,000	88,000	143,000	93,000	60,000
Bighorn sheep habitat (acres)	30,000	44,000	35,000	35,000	45,000	35,000	30,000
Key sage-grouse habitat (acres)	19,000	37,000	22,000	23,000	49,000	22,000	19,000
Sage-grouse leks (occupied)	6	12	6	7	11	6	6
Sage-grouse leks (other)	0	0	0	0	9	0	0
Sage-grouse leks (unoccupied)	1	1	1	1	1	1	1
Sharp-tailed grouse leks (occupied)	0	0	0	0	0	0	0
Ferruginous hawk (nest sites)	1	1	1	1	1	1	1
Prairie falcon (nest sites)	1	4	4	4	4	4	1
Lewis's woodpecker (sites)	0	1	1	1	1	1	0
Pygmy rabbit (sites)	0	0	0	0	0	0	0
Spotted frog (streams)	0	1	1	1	1	1	0

	Alternative						
	No Action	I	II	III	IV	V	VI
Riparian/Perennial streams (miles)	84	184	172	172	181	177	84
Bruneau Dunes tiger beetle (acres)	0	0	0	0	0	0	0

If locatable minerals are discovered, impacts of development would not vary significantly between alternatives. Alternative IV recommends the most additional acreage for locatable mineral withdrawal and would be most beneficial to wildlife, followed by Alternatives I, V, III, the No Action Alternative, and II. Alternative VI would not propose additional locatable mineral withdrawals.

Salable Minerals

Salable minerals in the planning area are limited to gravel with some decorative rock. Salable minerals were projected to increase at most from 1,300 acres to 3,300 acres or about 0.2% of the planning area. Most of the active minerals pits are for gravel and are located in the northern part of the planning area. Three gravel pits are in the southern part of the planning area near Flat Creek, Deadwood Creek, and Cedar Creek Reservoir. These gravel sources are used primarily by local highway districts. A site specific analysis would be completed for any new salable mineral pits. Because of the small scattered areas potentially affected the analysis was the same for all alternatives. Decorative rock sites have a less defined area than gravel pits. However, more routes extend from decorative rock sites since people look for rocks with specific sizes, colors, or thicknesses.

The vast majority of habitat used by all BLM special status species in the planning area is potentially available for salable minerals. At this time there are no gravel pits in canyonland (bighorn sheep and bats), duneland (tiger beetle), aspen (Lewis's woodpecker), or riparian (spotted frog) habitats and none would be expected in any of the alternatives.

Salable mineral developments usually have a short-haul road (up to two miles) as well as the gravel pit. Disturbance would be associated with crushing, screening, and loading. In some instances blasting may occur. For most gravel pits annual use would be periodic when roads are spot treated or graveled, existing roads are upgraded and paved or paved roads are resurfaced. Infrastructure would be minor to negligible at the local scale whereas disturbance would be periodically minor to moderate at the local scale.

The vast majority of the planning area would be open in all alternatives. In most cases existing gravel pits would continue to be used and expanded if necessary. In some case a new pit may be needed for a special project where the current gravel sources are too distant for practical use.

Special status species distributions may change at the local scale during periods of increased activity or during blasting, crushing, or screening. Gravel pit operations for special projects may result in extended periods (several months) of activity.

Table 4-181. Selected Special Status Wildlife Habitat Component in Areas Open for Salable Minerals by Alternative

	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Open areas (acres)	1,200,000	1,282,000	1,266,000	1,103,000	1,135,000	1,162,000	1,250,000
Bighorn sheep habitat (acres)	2,000	19,000	13,000	3,000		2,000	6,000
Key sage-grouse habitat (acres)	253,000	286,000	282,000	215,000		220,000	278,000

	Alternative						
	I	II	III	IV		V	VI
				IV-A	IV-B		
Sage-grouse leks (occupied)	73	85	81	68		67	80
Sage-grouse leks (other)	88	90	90	76		83	90
Sage-grouse leks (unoccupied)	25	25	25	24		25	25
Sharp-tailed grouse leks (occupied)	2	2	2	2		2	2
Ferruginous hawk (nest sites)	58	58	59	56		58	58
Prairie falcon (nest sites)	23	23	23	22		22	22
Lewis's woodpecker (sites)	26	26	26	25		25	25
Pygmy rabbit (sites)	61	61	64	60		61	61
Spotted frog (streams)	4	4	4	4		4	4
Riparian/Perennial streams (miles)	138	203	144	123	125	122	138
Bruneau Dunes tiger beetle (acres)	700	700	700	700		700	700

Impacts from Areas of Critical Environmental Concern Actions

Special management identified for Areas of Critical Environmental Concern (ACECs) with relevant and important values for special status wildlife species are can help reduce human disturbance, reduce route density, and seasonally restrict land use authorizations. These actions influence wildlife habitat, habitat use, and populations (Connelly et al., 2004; Ingelfinger and Anderson, 2004; Keller and Bender, 2007). Table 4-182 lists selected special status wildlife totaled for each alternative. Because no ACECs would be designated in Alternative II it is not included in Table 4-182.

The following indicators were used to analyze impacts from Areas of Critical Environmental Concern Actions on special status wildlife species:

- Change in upland acres of habitat for wildlife groups and
- Acres with special management emphasis (acres designated as an ACEC).

Table 4-182. Selected Special Status Wildlife Habitat Components within Areas of Critical Environmental Concern by Alternative

	Alternative [A]						
	No Action	I	III	IV		V	VI
				IV-A	IV-B		
Number of ACECs	3	5	3	5	5	4	4
ACEC size (acres)	89,000	97,000	61,000	333,000	230,000	966,000	22,000
Bighorn sheep habitat (acres)	41,000	41,000	29,000	45,000	45,000	49,000	9,000
Key sage-grouse habitat (acres)	28,000	28,000	20,000	153,000	103,000	302,000	5,000

	Alternative [A]						
	No Action	I	III	IV		V	VI
				IV-A	IV-B		
Sage-grouse restoration habitat (acres)	25,000	25,000	18,000	124,000	73,000	554,000	8,000
Sage-grouse leks (occupied)	7	7	7	34	26	87	2
Sage-grouse leks (other)	0	0	0	31	20	84	0
Sage-grouse leks (unoccupied)	1	1	1	8	5	19	0
Sharp-tailed grouse leks (occupied)	0	0	0	0	0	2	0
Ferruginous hawk (nest sites)	1	2	1	5	2	51	1
Prairie falcon (nest sites)	2	2	1	23	6	23	1
Lewis's woodpecker (sites)	0	0	0	6	7	26	0
Pygmy rabbit (sites)	0	0	0	6	4	63	0
Spotted frog (streams)	0	0	0	5	5	5	0
Bruneau Dunes tiger beetle (acres)	0	0	0	0	0	0	0
Riparian/perennial streams (miles)	142	157	84	196	162	276	49

[A] No ACECs were designated for Alternative II.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative does do not address restoration priorities within or outside ACECs.

Management direction would limit infrastructure density for Bruneau-Jarbidge, Salmon Falls Creek, and Sand Point ACECs. Bruneau-Jarbidge and Salmon Falls Creek ACECs would have the strongest protections.

A total of 89,000 acres of ACECs would remain designated. The Bruneau-Jarbidge ACEC provides habitat protection and restoration for sage-grouse, bighorn sheep, prairie falcon, and spotted bat and their habitats. The No Action Alternative would be third most beneficial to special status wildlife. Effects would be minor to moderate in the long term at the landscape scale.

Impacts from Management Specific to Alternative I

Alternative I would include ACECs being a priority for restoration. Habitat for sage-grouse could be increased in portions of the Bruneau-Jarbidge ACEC. Increases in flowering plants as part of restoration would enhance insect populations used by a number of special status species including sage-grouse and spotted bat. The elevated priority for wildland fire suppression could limit loss of sagebrush steppe within the ACEC.

Direction for the ACECs would limit large increases in infrastructure density including routes.

A total of 97,000 acres of ACECs would be designated. The Bruneau-Jarbidge ACEC would benefit sage-grouse, bighorn sheep, and other special status wildlife. The designation of the Lower Bruneau Canyon would have less benefit to special status wildlife due to its small size. Impacts of designating Sand Point and Salmon Falls Creek would be similar to the No Action Alternative. Alternative I would be the second most beneficial for special status wildlife. Impacts of ACEC designation would be moderate in the long term at the landscape scale.

Impacts from Management Specific to Alternative II

Existing ACEC designations along with the special management direction would be removed. Restoration of habitat would not be a priority in the former ACEC areas in this alternative. Sagebrush steppe habitats would continue to decline reducing habitat for sage-grouse in the long term. Decreased nocturnal moths from changes in vegetation (Luce and Keinhath, 2007) could reduce spotted bat numbers. A reduced prey base would likely result in lower reproductive rates for prairie falcons (Steenhof et al., 1999) and

ferruginous hawks (Smith et al., 1981). Alternative II would be least beneficial to special status wildlife over the long term.

Impacts from Management Specific to Alternative III

Because the Bruneau-Jarbidge ACEC lies within wilderness, improving habitat for sage-grouse or other special status species would be more difficult. The priority for suppression would likely maintain sagebrush habitat or slow its loss in the area.

A small amount of infrastructure at the Sand Point ACEC may increase due to information signs or a kiosk.

The acreage of ACECs would be reduced to 61,000 acres. Alternative III provides the second least benefit for special status wildlife. Impacts would be minor at the landscape scale in the long term.

Impacts from Management Specific to Alternative IV

ACECs would be priorities for suppression and restoration. Restoration associated with the Bruneau-Jarbidge, Inside Desert, and Jarbidge Foothills ACECs would increase habitat for sage-grouse and other special status wildlife in the sagebrush steppe group. Restoration would be negligible in the short term and have a minor to moderate benefit in the long term for sage-grouse and other special status wildlife in the sagebrush steppe group.

There would be temporary localized disturbance during restoration activities. ACECs would be right-of-way (ROW) avoidance areas limiting the types of ROW issued helping maintain current infrastructure density. Management actions in the Inside Desert ACEC would reduce infrastructure density at the local scale. Infrastructure density in the Bruneau-Jarbidge and Jarbidge Foothills would remain relatively stable.

Alternative IV-A would designate 333,000 acres of ACECs whereas Alternative IV-B would designate 230,000 acres of ACECs. The difference would be the area in the Inside Desert and Jarbidge Foothills ACECs would be smaller in Alternative IV-B. Fire suppression would be priorities reducing habitat conversion to grassland, whereas restoration would increase sagebrush steppe and mountain mahogany/mountain shrub in the long term benefiting special status wildlife in these habitats. Overall, Alternative IV has most benefit for special status wildlife. Effects would be moderate to major in the long term at the landscape scale.

Impacts from Management Specific to Alternative V

Although restoration would be a priority, long-term restoration would be hindered by spot planting sagebrush then letting it re-establish through natural processes.

Alternative V would create 966,000 acres of ACECs. Within the ACECs range infrastructure may be reduced. Although route density may decrease, the change may not be substantial. Mineral exploration and development are not prohibited. These activities could require an increase in roads.

ACECs would be priorities for wildland fire suppression and restoration. The larger area being a priority for suppression somewhat reduces the effectiveness, which would likely result in the loss of some sagebrush habitat if there are multiple starts. The ACEC would be an avoidance area for communication sites, wind energy development, and other land use authorizations. Management of the ACECs would help reduce habitat conversion to grassland. Although Alternative V has the most area designated as ACECs, the large size limits suppression and restoration focus. Special management was also limited for some resource uses. Alternative V has the fifth most benefit to wildlife. Impacts would be moderate at the landscape scale long term

Impacts from Management Specific to Alternative VI (Proposed RMP)

The restoration priority for the Upper Bruneau Canyon ACEC would enhance habitat for sage-grouse. Portions of the Upper Bruneau ACEC would be canyonland habitat limiting the amount of restoration to sagebrush steppe. The increase in sagebrush steppe would be negligible in the short term and minor in the long term, due to the limited acres restored.

Infrastructure density would not be likely to change in the Upper Bruneau or Salmon Falls Creek ACECs. Potential infrastructure in the Sand Point ACEC would be minimal (signs or a kiosk).

Only 22,000 acres of ACEC would be designated. The ACECs would be priorities for restoration and wildland fire suppression which would help reduce habitat conversion to grassland. Alternative VI has the fourth most benefit to wildlife. Impacts would be minor to moderate locally and minor at the landscape level in the long term.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

Direction in the existing 1987 Jarbidge RMP is generally outdated for sage-grouse, bighorn sheep, and does not adequately address a number of special status wildlife species.

The 1987 did not contain much direction on restoration location, amount, or types of plan communities to be restored. However, it did provide non-native grass seedings be maintained in several multiple use areas. The fuels program would continue to restore some areas burned in large wildland fires in 2007. Riparian habitat would continue to be managed to achieve proper functioning condition (PFC) in the long term.

The entire planning area would remain critical suppression. Based on current policy, the wildland urban interface (WUI) would remain the highest priority. Remaining key sage-grouse habitat would remain a priority for suppression after the WUI. Fast moving wildland fires from grasslands are expected to continue to burning sagebrush steppe habitat. Future fuel breaks could be installed which, if successful, may reduce wildland fire size.

Some new range infrastructure would be constructed. Some of the new infrastructure would be to protect resources and others would modify livestock distribution. Animal unit months (AUMs) would increase to 260,000 acres. However, the changes would be limited to the targets for multiple use areas.

Recreation would continue to be generally dispersed. Routes used by recreationists for fishing, hunting, and motorized would continue to expand. This would include increase route density in sage-grouse habitat in the Brown’s Bench and China Mountain areas.

About 342,000 acres remain open to cross-country motorized vehicle use in Elmore and Twin Falls Counties. New routes will continue to be made by various public land users increasing route density. Cross-country motorized vehicle use also increases the chance of wildland fires during the summer. The change from open to limited to existing routes in Owyhee County should minimize future motorized vehicle impacts in duneland habitat and limit the creation of new routes in the Owyhee County.

The existing Pilgrim Gulch, Shoestring, Balanced Rock, and Saylor Creek utility right-of-way (ROW) corridors for utilities would remain. No new utility ROW corridors would be identified. Land use authorizations such as communications sites and wind energy development would result in some new tall structures being constructed in sage-grouse habitat. Wind energy development could occur on 172,000 acres. A wind farm would increase infrastructure density due to routes, power lines, buildings, and turbines. Wind energy development in southeastern portion of the planning area would have a high probability of adversely impacting sage-grouse habitat. Mitigation may reduce some adverse impacts.

The demand for salable minerals would increase, generally expanding existing gravel pits. Special projects would likely require development of new gravel sources. A limited amount of oil and gas exploration would likely occur in the southeastern and northern parts of the planning area. Exploration for gas or oil would result in some damage to habitat. If testing shows the deposit is productive additional roads, pipelines, and power lines would be constructed. Oil or gas development in the southeastern part of the planning area would have a probability of adversely impacting sage-grouse, sharp-tailed grouse, and spotted frog habitat.

Continued management of the Bruneau-Jarbidge Area of Critical Environmental Concern (ACEC) is expected to maintain the current low levels of human disturbance, minimizing displacement of bighorn sheep from habitat. The Bruneau-Jarbidge and Salmon Falls Creek ACECs provide protection for a variety of special status wildlife in the canyonland group including prairie falcon, spotted bat, and other bat species.

Overall management in the No Action Alternative would likely continue to result in declining habitat for special status wildlife associated with the sagebrush steppe. Moderate to major adverse effects would be due to a combination of factors including limited restoration, continued wildland fires, land use authorizations, and to a lesser degree livestock grazing.

The No Action Alternative provides the least management direction and restoration. The inclusion of ACECs raises the No Action Alternative to the second least beneficial to special status wildlife.

Impacts from Alternative I

Special status wildlife management would help reduce impacts from resource uses by providing direction on important seasonal periods, distances from important features (sage-grouse leks, ferruginous hawk and prairie falcon nests, etc.), and direction regarding residual herbaceous vegetation. Fire suppression and restoration would be priorities in special status wildlife habitats. Direction regarding residual cover for sage-grouse nesting and aspen management could provide some benefits to special status species in these habitats.

Over the long term, habitat restoration to meet vegetation and wildland fire and ecology management objectives would increase habitat patch size for sage-grouse and other sagebrush steppe special status species. Vegetation Management Areas (VMAs) C and B have higher suppression priority than other VMAs if there are multiple wildland fire starts. New roads, fuel breaks, and other infrastructure to facilitate wildland fire suppression may reduce wildland fire size. However, new roads and fuel breaks would increase infrastructure density and disturbance.

The estimated 30% to 40% utilization of native grasses to achieve resource and use objectives would provide some residual herbaceous cover for nesting sage-grouse. Total AUMs would be about 245,000, or a little less than the No Action Alternative. Fence density would increase in large part due to the amount of fence (150 miles) required to enclose references areas. Existing water pipelines would be expanded in some area, new water pipelines would be installed or fences constructed to modify livestock distribution. Increased fences would increase mortality to some special status wildlife species. Open ponds or troughs could benefit special status bats by increasing upland water sources.

Management focus for the Canyonlands and Jarbidge Foothills Special Recreation Management Area (SRMA) would be on primitive recreation which would not require additional infrastructure and maintain relatively low levels of human disturbance. Infrastructure associated with Salmon Falls Reservoir SRMA would reduce damage to habitat. The Deadman/Yahoo SRMA would focus on motorized recreation.

Alternative I would change most of the planning areas to limited to existing routes which should reduce the creation of new routes. Two Travel Management Areas (TMAs) (Canyonlands and Jarbidge Foothills) have a focus on increasing core habitat size (reduce route density) in the Jarbidge Foothills and Canyonlands which cover about 348,000 acres. About 4,000 acres would remain open to cross-country motorized vehicle use associated with recreation. The effects of reducing route density could be offset by exceptions to motorized vehicle restrictions that may be granted to permit, lease, and ROW holders.

The Jarbidge Nevada utility ROW corridor would be created and the current four utility ROW corridors would remain. The corridors would be the same in Alternatives II through V. The Jarbidge Nevada corridor includes more key sage-grouse habitat than other corridors. Infrastructure associated with land use authorizations including communication sites, power lines, roads, and other ROWs would contribute directly to habitat loss (footprint of the project). About 77,000 acres of wind energy development would be expected, part of which would be in the southeastern part of the planning area. Habitat used for wintering, nesting, and brood rearing by sage-grouse and sharp-tailed grouse would be present in the expected wind energy development area for Alternative I. Mitigation may reduce some adverse impacts.

Disturbance during operation of the facilities and displacement or mortality (e.g., colliding with infrastructure or vehicles) are not mitigated by seasonal constraints.

Some land use authorizations would likely require the use of gravel for maintenance roads or parking areas. No oil and gas leasing is expected to occur within 15 miles of bighorn sheep habitat.

ACECs would have an elevated priority for wildland fire suppression and restoration of upland and riparian habitat benefitting sage-grouse and bighorn sheep in restored areas.

Overall, management in Alternative I would result in moderate beneficial impacts to special status wildlife in the sagebrush steppe and mountain mahogany/mountain shrub groups in the long term, particularly due to restoration. Moderate positive impacts should occur in riparian habitat in the long term. Also management actions would provide beneficial impacts to aspen and canyonland habitat in the long term. Oil and gas or wind energy development in the southern part of the planning area would be a minor to moderate adverse effect for special status species in that area.

Alternative I would have the fourth most restoration of shrublands, rank near the middle for ACECs, and overall has a moderate amount of direction for a variety of land uses. Overall, Alternative I would rank as fourth least beneficial to special status wildlife.

Impacts from Alternative II

Special status species management is at the most reduced level in this alternative. Seasonal restrictions to mitigate effects of resource uses on special status wildlife during important seasonal periods would be limited. Sage-grouse habitat would be managed for a four inch residual cover within one mile of occupied leks in native shrubland habitat.

Shrub control in non-native perennial seedings would prevent sagebrush re-establishing. The focus on converting annual grassland to non-native perennial grasses would have little benefit for special status wildlife. Riparian areas, currently at PFC, would maintain PFC. Riparian areas not at PFC would be managed to improve over time.

VMAs A and B would have the highest wildland fire suppression priorities during multiple ignitions. Special status species habitat would not necessarily be a high priority for suppression. As a result, sagebrush steppe and mountain mahogany/ mountain shrub habitats in VMAs C and D could be reduced.

Alternative II would authorize the most AUMs (440,000) and allocate the most vegetative biomass to livestock grazing. Allowing 40% to 50% use of many native grasses would be less likely to provide adequate residual grass height for sage-grouse during nesting. Use levels to meet resource and use objectives would result in less variation of residual cover for special status species. Use levels of 50 to 60% on non-native grasses would create more uniform grass heights and could reduce wildland fire size and rate of spread. Up to 62 miles of new fence would be needed to create reference areas. Other new fence would be constructed to improve grazing management. Existing water pipelines would be extended and new pipeline installed to improve livestock distribution and meet AUM targets. Increased infrastructure density would increase human disturbance.

Alternative II would have the fewest SRMAs and none with a motorized focus. The Salmon Falls Reservoir SRMA would resolve some damage resulting from recreation in the Browns Bench area.

There would be no areas open to cross-country motorized vehicles. TMAs in Alternative II would allow the most routes to facilitate access for land uses, wildland fire suppression, and other administrative purposes, increasing route density. None of the TMAs have an objective to reduce route density. Authorizing exceptions to motorized vehicle restrictions for permit, lease, and ROW holders would result in continued use of undesignated routes and creation of new routes.

Land use authorizations associated with communication sites, ROWs, power lines, and renewable energy would result in additional roads. The expected wind energy area would be 206,000 acres and would include all the southeastern part of the planning area. New roads and utility infrastructure could be

located through much of the planning area rather than following existing disturbance corridors where practical.

Mineral exploration and development would have the least seasonal, controlled surface use, or no surface occupancy constraints in Alternative II. Exploration for gas or oil would result in some minor damage to habitat. If testing shows the deposit is productive, additional roads, pipelines, and power lines would be constructed increasing impacts minor adverse impacts. Alternative II would result in the most salable mineral development to gravel some existing roads, new roads, and projects.

No areas would be managed as ACECs eliminating any focus management which benefit special status wildlife.

Under Alternative II, moderate to major adverse impacts to wildlife in the sagebrush steppe and mountain mahogany/mountain groups would occur due to increased road and infrastructure density associated with land use authorizations, fuel breaks, and livestock grazing. The demand for salable minerals would be higher due to increased land use authorizations and new roads. The minimal seasonal or spatial direction does little to mitigate direct or indirect effects. The suppression priority would help sagebrush in VMA B persist, but having VMA A as a suppression priority could divert resources from wildland fires in VMAs C or D. The increased levels of AUMs would reduce herbaceous cover but may result in slower wildland fire spread. Removing shrubs from seedings would maintain extensive grassland areas.

Restoration would be limited to 22,000 acres. The emphasis on new development would be expected to increase a substantial amount of new infrastructure for most land uses except recreation. Management in place for existing ACECs would be removed. Alternative II would be least beneficial to special status wildlife.

Impacts from Alternative III

Special management would help protect bighorn sheep, ferruginous hawks, prairie falcon, and sage-grouse. Areas within three miles of occupied and status unknown sage-grouse leks would be managed to provide four inches or more of residual herbaceous vegetation for nesting. Some direction would be provided for other special status wildlife.

Alternative III has the most new fuel breaks, widest fuel breaks and the only alternative with unvegetated fuel breaks. Fuel breaks, especially unvegetated fuel breaks, would decrease habitat. In the long term, riparian and sagebrush steppe restoration could increase the amount of habitat for some special status wildlife.

The wildland fire suppression priority is VMAs B and A in this alternative. Rapid suppression of wildland fires in VMA B should help reduce the conversion of sagebrush to grassland. Suppression of wildland fires in VMA A would shift suppression resources from sage-grouse habitat in VMAs C or D. Unvegetated fuel breaks would have the best chance of stopping a wildland fire. Alternative III would have the most infrastructure associated with wildland fire suppression.

The amount of AUMs (348,000) is second highest of the alternatives. About 75 miles of new fence would be needed to enclose reference areas. Additional fences, water pipelines, and other infrastructure would likely be needed to enhance livestock distribution. The 30% to 40% utilization in native plant communities would be the same as Alternative I, whereas 50% to 60% use would be like Alternative II. The 50% to 60% use on non-native perennial grasses may help reduce wildland fire size and rate of spread.

Salmon Falls Reservoir and Little Pilgrim SRMAs would resolve on-going resource damage.

No TMAs have a focus to reduce route density. The same as Alternative I, 4,000 acres would remain open for cross-country motorized vehicle use. Alternative III would improve roads and access to facilitate wildland fire suppression. Improved and new roads would encourage more human activity in areas where human disturbance is generally minor. Authorizing exceptions to motorized vehicle restrictions for permit, lease, or ROW holders would maintain overall route density and offset some of the increase in patch size due to restoration in the sagebrush steppe.

The same utility ROW corridors in Alternative I would be designated in this alternative with the same effects. Alternative III would allow new infrastructure, including roads, to be placed without regard to existing disturbance corridors. Wind energy development in the southeastern part of the planning area would adversely impact sage-grouse.

Effects of leasable, locatable, and salable minerals would be similar to Alternative II.

The Bruneau-Jarbidge ACEC boundary would be reduced and would overlap designated wilderness. The Salmon Falls Creek ACEC would continue to provide protection to special status bats and prairie falcons.

Overall, management in Alternative III would result in increased habitat loss due to unvegetated fuel breaks. Facilities associated with other wildland fire-related projects (pipelines, new routes, helispots), land use authorizations, and range would increase route and infrastructure density. To the extent unvegetated fuel breaks stop wildland fires, they could protect habitat. Fuel loads would be lower due to more intensive management including targeted grazing and permitted grazing. These measures in concert may slow the rate of wildland fire spread. Restoration would reduce or potentially offset minor to moderate adverse impacts of habitat loss and fragmentation of sagebrush steppe, mountain mahogany/mountain shrub, and riparian habitats in the long term. Minor beneficial impacts would occur in aspen and canyonland habitat in the long term. Duneland habitat is expected to experience minor adverse impacts.

Alternative III would have the most infrastructure related to wildland fire suppression and fuels, second most infrastructure associated with land uses, third least amount of restoration of sagebrush steppe, and would designate only 4,000 acres of land as ACECs outside wilderness. Alternative III ranks third least beneficial to special status wildlife.

Impacts from Alternative IV

Alternative IV includes management direction for bighorn sheep, sage-grouse, and other special status wildlife. Direction includes spatial distances as well as seasonal restrictions for routine maintenance and initial project construction. A seven inch residual herbaceous height guideline for pastures with native plant communities and non-native understory within three miles of sage-grouse leks should provide suitable nesting cover even during drought. Direction would also be present for other special status wildlife.

Restoration would increase sagebrush steppe and mountain mahogany/ mountain shrub habitats in ACECs and special status species habitats.

After the WUI, key sage-grouse habitat in VMAs C and D are the highest suppression priority during multiple wildland fires, protecting special status wildlife habitat. Sagebrush steppe habitat in VMA B would be more vulnerable to loss. Livestock management of non-native perennial plant communities at 30% to 40% would encourage the accumulation of previous years' growth and increase fine fuel for wildland fires.

Alternative IV-A has the second largest area closed to livestock grazing, reducing impacts of grazing to special status species in closed areas. The amount of AUMs is second (123,000) and third (127,000) lowest in Alternatives IV-A and IV-B, respectively. About 150 miles of new fence would be needed to enclose the 75 reference areas 160 acres in size. Reduced AUMs would likely require less pipeline and fence to alter livestock distribution. The 20% to 30% utilization in native plant communities would leave more residual herbaceous vegetation for nesting sage-grouse. The low levels of use and improved management would likely reduce livestock impacts to aspen stands.

The Canyonland SRMA would focus on primitive recreation. Deadman/Yahoo SRMA and Salmon Falls Reservoir would be the same as Alternative III.

Four TMAs would focus on increasing core habitat size (reducing route density) on about 1,016,000 acres, primarily in the southern portion of the planning area, which contains the majority of the remaining habitat for sage-grouse and sharp-tailed grouse. Authorizing exceptions to motorized vehicle restrictions for permit, lease, or ROW holders would maintain overall route density. A total of 4,000 acres would be

designated open areas for motorized recreation. Route density would increase in the 34,000 acre Deadman/Yahoo TMA to provide a trail system for motorized recreation.

Land use authorizations for communication sites, power lines, and renewable energy would result in additional roads and increased infrastructure density. Direction would have new infrastructure placed in disturbed areas when practical. The majority of the southeastern portion of the planning area would not be available for wind energy development.

Salable, leasable, and locatable minerals would be similar to Alternative I.

Alternative IV-A contains the second and IV-B the third largest acreage of ACECs. The expanded Bruneau-Jarbidge ACEC provides management direction for bighorn sheep and sage-grouse. ACECs would be priorities for restoration. The Jarbidge Foothills ACEC would provide protection for sage-grouse and other special status wildlife. Due to size changes the Jarbidge Foothills ACEC in Alternative IV-B would protect less area and special status species habitat than IV-A. The Inside Desert ACEC has little sage-grouse habitat.

Alternative IV has the most active restoration to resulting in a major beneficial increase sagebrush steppe and to a lesser degree mountain mahogany/mountain shrub and riparian habitats. Alternative IV would result in the least infrastructure once reference areas are fenced. Route and infrastructure density may decline because of some management for the Inside Desert ACEC. Sage-grouse habitat and suppression priority in VMAs would best align with remaining important sage-grouse habitat. Alternative IV would provide suitable residual cover for nesting sage-grouse, but may contribute to wildland fire size or rate of spread.

Direction, amount of restoration, and acreage of ACECs result in Alternative IV ranking most beneficial for special status wildlife.

Impacts from Alternative V

Special management for sage-grouse includes having a seven inch residual herbaceous height for shrubland and perennial grassland with mostly native cover within five miles of occupied and status unknown leks. Seasonal and spatial limitations are in effect to reduce impacts to special status species and their habitat during important seasonal periods.

The third largest upland restoration would increase shrubs in native grassland and convert annual grassland to sagebrush steppe in the long term. The spread of shrubs from these areas would be slow. Passive restoration would lead to a slow recovery. Moderate beneficial impacts for native shrublands would accrue over time.

Key sage-grouse habitat would be a high priority for wildland fire suppression in VMAs C and B minimizing habitat loss. The large Sagebrush Sea (956,000 acres) would reduce the value of setting suppression priorities to cover the large critical suppression area. Fewer fuel breaks and no construction of new roads would minimize additional habitat loss.

Alternative V would close the largest area to livestock grazing nearly 310,000 acres and have the least AUMs (85,000). Estimated utilization levels of 20% to 30% in native areas and 30% to 40% in non-native perennial grassland would help achieve resource objectives. New range infrastructure would be minimal due to the pasture-sized reference areas. Although Alternative V would leave the greatest amount of residual cover for sage-grouse nesting, it also leaves the most herbaceous matter to carry wildland fires.

Alternative V would have the fewest SRMAs and the least acreage of SRMAs minimizing the potential minor adverse impacts to special status wildlife.

Three TMAs (Devil Creek, Jarbidge Foothills, and Westside) have a focus to reduce route density on 1,027,000 acres. There would only be 3,000 acres open to cross-country motorized vehicle use in the Yahoo area. Not granting exceptions to motorized vehicle restrictions for permit, ROW, or lease holders would help ensure routes designated as closed would not continue to be used.

Infrastructure would be located to the extent practical in disturbance corridors. The expected wind energy development area would be 72,000 acres and would not include the southeastern part of the planning area minimizing potential impacts from increased infrastructure and route density.

Salable, leasable, and locatable minerals would be similar to Alternative I. The demand for salable minerals would be least in Alternative V due to fewer land use authorizations being expected since large areas would be closed or available with restrictions.

Estimated utilization levels of 10% to 20% in the Sagebrush Sea ACEC, which has the bulk of the sage-grouse habitat, would provide adequate residual cover for sage-grouse nesting during nearly all years. It may also contribute to a rapid spread of wildland fires.

Overall, management in Alternative V would minimize the creation of new routes associated with land use authorizations and livestock grazing. The low level of grazing long term may contribute to wildland fires. Strategically placed fuel breaks in moderate or greater winds would largely be ineffective at stopping wildland fires in part due to fuel loads. Some types of land use authorizations would be restricted from large areas. Reductions in route density would reduce impacts on special status wildlife. Active restoration would help increase habitat for special status wildlife in the sagebrush steppe and mountain mahogany/mountain shrub groups in the long term. Minor beneficial impacts would occur in mountain mahogany, aspen and canyonland habitat, but major beneficial impacts would occur in sagebrush steppe habitat in the long term. Alternative V ranks third most beneficial to special status wildlife.

Impacts from Alternative VI (Proposed RMP)

Alternative VI is the only alternative that designates a large sage-grouse management area (893,000 acres). Within this area residual herbaceous cover would be managed to provide for four inches or more cover for sage-grouse nesting within three miles of occupied or unknown leks. Seasonal and spatial distances are included for a variety of resource uses. Vegetation restoration would be focused on expanding sagebrush steppe islands and connecting habitat islands. Restoration of shrublands would result in a major beneficial impact to species status wildlife at the landscape scale in the long term.

After the WUI, the suppression focus would be on areas with key sage-grouse habitat in VMAs C and B and key sage-grouse habitat should minimize habitat loss in these areas. Depending on the location some fuel breaks may divide some sagebrush steppe habitat. Fuels restoration projects in other areas would increase sagebrush steppe and mountain mahogany/mountain shrub habitats. Fuel break miles would be 11,000 acres the same as Alternatives I and II which should lessen habitat impacts compared to Alternatives II and III.

Areas closed to livestock grazing would be fourth smallest and AUMs would be third highest (279,000) at full implementation. In addition up to the 62 miles of fence could be needed for reference areas, some additional fences could be installed to protect resources or facilitate grazing management. Use levels and subsequent residual cover would be the same as Alternative I.

Alternative VI would create two Extensive Recreation Management Areas (ERMAs; 282,000 acres) for primitive recreation, two SRMAs (16,000 acres) and one ERMA (19,000 acres) for motorized recreation, four smaller SRMAs (4,000 acres) and one ERMA (3,000 acres) for fishing, hiking, hunting, and camping. At the landscape scale potential adverse impacts would be negligible to minor.

Some routes would be improved to reduce the response time for wildland fire suppression. One TMA in the southern portion of the planning area have a focus of reducing route density to increase core habitat for sage-grouse and other wildlife. Granting permit holders authorization for cross-country travel would somewhat negate route designation.

Some types of land use authorizations including wind energy would be less in Alternative VI due to avoidance stipulations to protect the sage-grouse management area. Other forms of renewable energy may also be hindered if they have tall structures. The Jarbidge Nevada utility ROW corridor would not be designated. The Roseworth utility ROW corridor would be designated near Lilly Grade. Also Alternative VI

would recognize the existing oil/gas pipeline as a corridor. Land use authorizations would result in minor adverse impacts to special status wildlife.

Salable, leasable, and locatable minerals would be similar to Alternative I. Exploration for gas or oil would result in some damage to habitat. If testing shows the deposit is productive additional roads, pipelines, and power lines would be constructed. Minor to moderate adverse impacts of development would likely occur at the landscape scale long term.

The ACEC provides direction for wildland fire suppression and restoration of habitat for bighorn sheep, sage-grouse, and some special status wildlife. The Lower Bruneau Canyon and Salmon Falls Creek ACECs would provide suppression and restoration direction in an area used by several special status species.

Management direction in Alternative VI provides greater protection for sage-grouse habitat than other alternatives. Restoration ranks second of the alternatives. Overall Alternative VI would provide the second most benefit to special status wildlife at the landscape scale.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis boundary varies among focus species.

Sage-grouse

The cumulative impact analysis area includes identified sage-grouse habitat in the planning area and an area 40 miles east, south and west of the planning area. This distance was selected based on radio telemetry data indicating several sage-grouse within the planning area traveled from 20 miles up to 39 miles taking them well beyond the planning area. No telemetry data indicate sage-grouse cross the Snake River leaving the planning area to the north. Therefore this area was not included in the cumulative impacts analysis area for sage-grouse. Idaho Department of Fish and Game (IDFG) have four classifications for leks (occupied, not verified, undetermined, and unoccupied). Nevada Department of Wildlife (NDOW) uses three categories, active, inactive, and unknown. For the purposes of the analysis leks were placed into the following categories (occupied, unknown, and unoccupied). Table 4-183 lists the numbers of leks within the sage-grouse cumulative impacts analysis area. Lek data provided did not cover the Jarbidge or Mountain City Ranger Districts or Tuscarora Field Office in Nevada. Approximately, 4,930,000 acres of sage-grouse habitat are present in the sage-grouse cumulative impacts analysis area. Within the cumulative impacts analysis area wildland fires have reduced sage-grouse habitat by 1,497,000 acres from 1987 through the 2011. The BLM manages over 61% of the sage-grouse cumulative impacts analysis area, whereas the Forest Service manages over 10%.

Table 4-183. Sage-grouse Leks and Habitat within the Cumulative Impact Analysis Area by Administrative Area

Administrative Area	Occupied Leks	Unknown Leks	Unoccupied Leks	Sage-grouse Habitat (Acres)	Habitat Burned (Acres)	% Burned	Leks within Burned
Bruneau Field Office	113	109	11	1,151,000	134,000	11.6%	3
Burley Field Office	55	56	8	190,000	35,000	18.4%	11
Jarbidge Field Office	96	114	21	911,000	600,000	65.9%	112
Owyhee Field Office	7	18	1	80,000	12,000	15.0%	0
Tuscarora Field Office	DNP	DNP	DNP	269,000	49,000	18.3%	DNP
Wells Field Office	30	208	29	1,334,000	475,000	35.6%	90
Jarbidge Ranger District	DNP	DNP	DNP	245,000	61,000	24.9%	DNP

Administrative Area	Occupied Leks	Unknown Leks	Unoccupied Leks	Sage-grouse Habitat (Acres)	Habitat Burned (Acres)	% Burned	Leks within Burned
Mountain City Ranger District	DNP	DNP	DNP	479,000	92,000	19.2%	DNP
Cassia Unit, Sawtooth National Forest	26	35	0	271,000	29,000	10.7%	8

DNP=Data not provided.

Table 4-184 lists the general ownership within the cumulative impacts analysis area for sage-grouse.

Table 4-184. Land Ownership within the Administrative Areas Overlapped by the Sage-grouse Cumulative Impacts Analysis Area (Acres)

Administrative Area	BLM	State	Private	National Forest	Other	Military
Bruneau Field Office	1,297,000	107,000	161,000	0	146,000	700
Burley Field Office	301,000	19,000	520,000	0	1,000	500
Jarbidge Field Office	1,371,000	78,000	241,000	0	4,000	115,000
Owyhee Field Office	107,000	6,000	19,000	0	0	0
Tuscarora Field Office	269,000	0	261,000	0	145,000	0
Wells Field Office	1,336,000	0	253,000	0	200	0
Jarbidge Ranger District	0	0	5,000	42,000		0
Mountain City Ranger District	0	0	36,000	446,000	40	0
Cassia Unit, Sawtooth National Forest	0	0	6,000	303,000	0	0

Bighorn Sheep

NDOW re-introduced bighorn sheep into the Badlands area near Contact, NV in the northern part of Elko County. There is no evidence that bighorn sheep in this area move to bighorn sheep habitat in the Bruneau and Jarbidge River Canyons. IDFG radio telemetry data have documented bighorn sheep movements between Big Jacks, Little Jacks, and the Owyhee Front. Existing telemetry data do not show movements of bighorn sheep from Owyhee River, Big Jacks, and Little Jacks or other parts of the Owyhee Front to the Bruneau/ Jarbidge bighorn sheep management unit. Therefore the cumulative impacts analysis area for bighorn sheep is the IDFG Bruneau-Jarbidge bighorn sheep population management unit which includes portions of the planning area and part of the adjoining Bruneau Field Office.

Within this area data indicate bighorn sheep move between the Bruneau and Jarbidge Rivers but less frequently to Sheep Creek. Within the bighorn sheep cumulative impacts analysis area about 97% of the bighorn sheep observations are within one mile of the canyons. In other areas bighorn sheep are known to travel long distances during forays, however, there is no information regarding foray distance locally. Table 4-185 presents the ownership, infrastructure, and amount of habitat burned in the Bruneau-Jarbidge population management unit. Domestic sheep allotments within nine miles of the population management unit include one in Jarbidge Ranger District, two in the Mountain City Ranger District and none in the Jarbidge or Bruneau Field Offices. Nine miles is the recommended separation distance from bighorn sheep to domestic sheep mentioned in the Western Association of Fish and Wildlife Agencies (2012). Domestic sheep trail from the Cedar Butte 10 Allotment in the planning area to the Guerry Sheep Allotment in the Jarbidge Ranger District.

Table 4-185. Ownership, Infrastructure, and Habitat Burned Within the Bruneau-Jarbidge Bighorn Sheep Population Management Unit

	Bruneau Field Office	Jarbidge Field Office
BLM (acres)	62,500	105,600
Private (acres)	2,500	2,200
State (acres)	3,800	6,000
Total (acres)	68,800	114,800
Routes (miles)	79	119
Route density (miles/mile^2)	0.73	0.67
Fence (miles)	19	20
Fence density (miles/mile^2)	0.18	0.11
Pipelines (miles)	0	13.7
Pipeline density (miles/mile^2)	0	0.08
Power lines (miles)	0	3.6
Power line density (miles/mile^2)	0	0.02
Habitat burned from 1987 – 2011 (acres)	9,300	58,400

Columbia Spotted Frog

Although there are historic spotted frog observations in the upper portion of Columbet and Corral Creeks in Jarbidge River watershed in Nevada, this species has not been found since 1992. Both historic records were in the Jarbidge Ranger District. Sixteen tributary streams to Salmon Falls Creek contain spotted frogs. Most of the spotted frog locations are in tributaries to North Fork Salmon Falls Creek in the Jarbidge Ranger District, Wells (NV) Field Office, and the planning area. No spotted frogs were documented in the Burley Field Office or eastern tributaries of Salmon Falls Creek in northern Nevada. As a result, the cumulative impacts analysis area was limited to the perennial streams in the North Fork Salmon Falls Creek watershed upstream of Bonanza Canyon in northern Nevada.

Table 4-186. Spotted Frog Locations in the Salmon Falls Creek Watershed by Stream Name

Stream Name	Administrative Boundary	Number of Sites
Bear Creek	Jarbidge/Wells Field Office	3
Canyon Creek	Wells Field Office	3
Cottonwood Creek	Jarbidge Ranger District.	1
Dry Creek	Wells Field Office	3
Jake Creek	Wells Field Office	2
Middle Fork Deer Creek	Wells Field Office	2
North Fork Salmon Falls Creek	Wells Field Office	1
O'Neil Creek	Jarbidge Ranger District	4
Rocky Canyon	Jarbidge Field Office	9
Shack Creek	Jarbidge Field Office	6
Sun Creek	Jarbidge Ranger District/Wells Field Office	5
Timber Canyon	Jarbidge Field Office	1
Willow Creek	Jarbidge Ranger District	1
Wilson Creek	Jarbidge Ranger District	2
Unnamed Tributary	Jarbidge Field Office	1

In Montana spotted frogs moved primarily along perennial streams between occupied drainages rather than overland (Funk et al., 2005). Spotted frog movement along riparian zones in the planning area should be similar, due in part to the drier climate. Distances between the planning area and spotted frogs in Salmon Falls Creek tributaries vary from 3 to 29 miles as measured along streams.

Table 4-187. Distances between Known Spotted Frog Locations Potentially Linking Habitat to the Planning Area

Stream Name	Distance	Administrative Boundary
Shack Creek to Bear Creek	7.5 miles	Jarbidge Field Office/Wells Field Office
Shack Creek to Rocky Canyon	12.5 miles	Jarbidge Field Office/Wells Field Office
Bear Creek to Rocky Canyon	12.5 miles	Jarbidge Field Office/Wells Field Office
Unnamed Tributary to Rocky Canyon	4.0 miles	Jarbidge Field Office
Wilson Creek to Rocky Canyon	17.5 miles	Jarbidge Ranger District/Wells/Jarbidge Field Office
Bear Creek (NV) to Unnamed Tributary (ID)	3.0 miles	Wells Field Office/Jarbidge Field Office
Canyon Creek to Rocky Canyon	29.0 miles	Wells Field Office /Jarbidge Field Office

[A] Distances are approximate.

Past, present, and reasonably foreseeable actions for the cumulative impact analysis focused on the following:

- Military Use,
- Land Use Plans,
- Upland Vegetation,
- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Transportation and Travel,
- Land Use Authorizations,
- Minerals, and
- Areas of Critical Environmental Concern (ACECs).

The following ownerships were considered in the cumulative impacts analysis – Air Force, BLM, Forest Service, Idaho Department of Lands, and private land.

Indicators

The following indicators were used for the cumulative impacts analysis for special status wildlife:

- Areas with special management emphasis and
- Change in distribution or numbers of special status wildlife.

Military Use

Air space associated with Mountain Home Air Force Base extends from southwestern Idaho into southeastern Oregon and northern Nevada including the western portion of the planning area. Saylor Creek and Juniper Butte Training Ranges operated by the Air Force lie within the planning area boundary. Use of air space associated with military operating areas is restricted. Military operating area size can be increased or decreased following environmental analysis. Infrastructure on the training ranges includes roads, buildings, fences, water pipelines and targets. Training exercises occur any time of day throughout the year but are most frequently daylight hours on week days. Aircraft fly at varying heights during training, but when approaching a target they are close to the ground. Supersonic flights, which create sonic booms, are authorized at or above 10,000 feet above ground level.

Table 4-188. Administrative Area Overlapped by Military Operating Areas Within the Sage-grouse Cumulative Impacts Analysis Area (Acres)

Administrative Area	Overlapped by Military Operating Areas
Bruneau Field Office	1,382,000
Burley Field Office	0
Jarbidge Field Office	1,240,000
Owyhee Field Office	23,000

Administrative Area	Overlapped by Military Operating Areas
Tuscarora Field Office	485,000
Wells Field Office	2,000
Jarbidge Ranger District	161,000
Mountain City Ranger District	464,000
Cassia Unit, Sawtooth National Forest	0

A variety of factors influence noise including: distance, aircraft height above ground, type of aircraft, speed, topography, vegetation, and weather. Although jets flying near the ground are loud, typically the noise is short duration. In Arizona bighorn sheep responded to simulated aircraft noise with elevated heart rates and modified (alarmed) behavior (Weisenberger et al., 1996). Weisenberger and others (1996) reported heart rates returned to normal within three minutes and the original behavior resumed within five minutes. Bighorn sheep responses to simulated aircraft noise decreased with repeated exposure which Weisenberger and others (1996) commented could represent habituation. Free ranging pronghorn selected areas with the lowest sound pressure levels and avoided areas with the highest sound pressure levels (Landon et al., 2003). Pronghorn on Saylor Creek Training Range have apparently adapted to the noise and activity associated with military aircraft training including the use of training munitions. At times the Air Force suspends training to remove pronghorn from target locations (USAF, 2007b). Golden eagles were generally unresponsive to civilian and military Apache helicopters in northern Utah (Grubb et al., 2010) which may have been influenced by topography, habituation, or other factors.

The Air Force sets up a number of portable emitters. Generators for the portable emitters produce continuous noise which at emitter sites as long as the emitter is in use. Portable emitters are moved to periodically to enhance training resulting in varied periods of noise and quiet at each emitter location. In Wyoming simulated drilling for oil/gas and roads during the breeding season resulted in a decline of male sage-grouse at noise treated leks compared to control leks (Blickley et al., 2012). Intermittent road noise produced a sharper decline than the relatively continuous drilling noise (Blickley et al., 2012). It is not known if generator noise associated with emitter sites would have a similar impact.

Table 4-189. Selected Infrastructure Associated with Mountain Home Air Force Base on Withdrawn BLM or State Lands in the Cumulative Impact Analysis Area

Infrastructure	Jarbidge Field Office	Bruneau Field Office
Communications sites	1	0
Emitter sites (0.25 acres)	8	10
Emitter sites (1.0 acres)	5	4
No drop zone (5 acres)	1	3
No drop zone (640 acres)	0	1

The Air Force is expected to continue training in the area for the foreseeable future. The Air Force periodically adjusts the type and number of aircraft stationed in Mountain Home. The training ranges are used not only used by the Air Force, but also by the Idaho National Guard, other branches of the US military, the Republic of Singapore (USAF, 2007a), and the Royal Saudi Air Force (USAF, 2012a). The Air Force would continue to modify infrastructure (buildings and targets) on the ranges to meet training needs. The Air Force has jurisdiction regarding infrastructure associated with Saylor Creek and Juniper Butte Training Ranges. Environmental analyses for future fences, pipelines or other facilities would be handled by the Air Force on military lands.

Land Use Plans

Burley Field Office operates under the Twin Falls Management Framework Plan. The Bruneau Field Office operates under the Bruneau Management Framework Plan. Both field offices are scheduled to begin land use planning in the next three years. The Wells (NV) Field Office operates under the Wells RMP. It also is scheduled to start a new land use plan in the next three years. Changes which limit transportation and travel to designated routes could reduce impacts to special status species habitat. If

new ACECs are created in the new land use plans they would likely include special management for special status wildlife. Boise District recently released a draft management plan for the wilderness designated in Owyhee County. Management for wilderness within the sage-grouse or bighorn sheep cumulative impact area will not likely change management for these special status wildlife species. The BLM held several scoping meetings to start the process of amending current land use plans in southern Idaho to incorporate sage-grouse management. The sage-grouse management direction in the land use plan amendments may reduce impacts to sage-grouse and their habitat. It is not known when the land use plan amendment process would be completed. Depending on the timing, the amendment could amend direction for sage-grouse in this plan.

Upland Vegetation

Large portions of the Saylor Creek Training Range burned in wildland fires and are now grassland. Outside the exclusive use area the Air Force seeded forage kochia in strips to function as fuel breaks and reduce the fine fuel load. The Integrated Natural Resources Management Plan for the Mountain Home Air Force Base did not address how much of the Saylor Creek Training Range has been treated in recent years to establish forage kochia. Amounts of future vegetation treatments or restoration are not listed for the Mountain Home Air Force Base and associated facilities (USAF, 2012b). The Integrated National Resources Management Plan states forage kochia would not be planted at the Juniper Butte Training Range. Although the Integrated National Resources Management Plan for the Mountain Home Air Force base mentions restoration, information regarding the amount or location of future restoration was not included.

In the 1950s and 1960s, the BLM reduced sagebrush and seeded thousands of acres to crested wheatgrass in areas near Roseworth, Browns Bench, Antelope Pocket, southwest of Horse Hill, Pot Hole Creek and Echo Seedings. The majority of the Echo Seeding is on the Saylor Creek Training Range area. Intermediate wheatgrass was seeded in areas near Cedar Creek, Three Creek, and the northern part of Browns Bench. The Jarbidge Field Office installed a number (greater than 90 miles) of 300 foot wide “green strips”. Green strips were seeded primarily with crested wheatgrass with lesser amounts of alfalfa. In some instances four-wing saltbush was included in the mix. The majority of the green strips were placed along major roads to help slow wildland fires. In the Burley Field Office the Berger Tract, which was previously farmed, was seeded to crested wheatgrass decades ago to reduce beet-leaf hoppers moving from public land to private land. The management plan for the area is to retain seedings for livestock forage. Tens of thousands of acres of crested wheatgrass were planted following wildland fires in Bruneau, Burley, Jarbidge and Wells (NV) Field Offices from the 1970s through 2011. Emergency stabilization and burned area rehabilitation plans have increased the use of seed for native or native cultivars which were not available in sufficient quantities to treat large wildland fires until the late 1990s.

A number of State sections were planted to crested wheatgrass following wildland fires by the lease holder. State sections at low elevations not planted usually became dominated by cheatgrass. In some instances the lease holder removed sagebrush and planted crested wheatgrass. More recently Idaho Department of Fish and Game (IDFG) and a variety of conservation groups purchased grass, forb, and shrub seed to be used on State lands after large wildland fires. IDFG, Nevada Department of Wildlife, and cooperators assist in restoring shrubland habitat by planting a variety of shrub species in areas burned in wildland fires.

Management of vegetation on private land is highly variable. Ranches frequently farm or irrigate meadows for forage and manage uplands as rangeland. The rangeland has been burned by some ranchers to reduce sagebrush and increase grass. Farm land is usually planted to crops which vary between years. In some cases farm land has been seeded to grass as pasture or enrolled in the Conservation Reserve Program.

The Jarbidge Field Office is currently in the process of preparing an Environmental Assessment in order to strategically install and maintain a series of fuels breaks in the planning area. Maintenance of fuel breaks may be accomplished through mowing, burning or other methods. Burley Field Office has a few fuels treatments to reduce juniper on the eastern portion of the sage-grouse cumulative effects area south of Oakley. Those treatments are expected to continue. Bruneau Field Office is in the very preliminary

stages of drafting a fuel break E.A. Prescribed burning is conducted on public lands. In the planning area most of the prescribed fires is used to reduce cheatgrass in conjunction with other treatments in areas dominated by cheatgrass. Dixie harrow projects have been conducted on State land in the planning area and in the Shoshone Basin in the Burley Field Office.

Wildland Fire

The Air Force maintains a 100 foot wide unvegetated buffer strip around the inside of the exclusive use area on the Saylor Creek Training Range. The strip is disked multiple times annually to prevent the establishment of cheatgrass and other annual species to minimize infrequent wildland fires ignited by training from escaping the exclusive use area. The Air Force has personnel or contractors to help suppress wildland fires which start on training ranges. The Air Force has an agreement with the BLM to station a BLM fire crew at the Juniper Butte Training Range during parts of the summer to reduce travel time to suppress wildland fires.

The Twin Falls BLM district has agreements with Boise and Elko BLM Districts to provide initial wildland fire suppression response to help contain wildland fire size. For example, fire crews stationed in Rogerson are able to rapidly respond to wildland fire starting in portions of the Burley and Jarbidge (south central Idaho) and Wells (NV) Field Offices. Suppression agreements are also in place with some rural communities. In the late 1980s and early 1990s the Jarbidge Field Office installed a number of greens strips to reduce wildland fire size. The fuels program is currently restoring sagebrush and other shrubs into large burned areas lacking sagebrush in the planning area to establish a seed source.

Livestock Grazing

Livestock grazing has occurred in the area since the 1870s. The BLM and Forest Service have issued permits for livestock grazing for more than 70 years. East, south, and west of the planning area by 40 miles there are all or parts of 373 allotments. The majority of the allotments are grazed by cattle, some by both cattle and sheep, and a few just by sheep. Herders with dogs accompany each band of sheep during the grazing period. To delineate allotments and facilitate grazing within allotments fences have been constructed and pipelines have been built.

Table 4-190. Livestock Grazing Infrastructure Associated with Grazing Permits on Public Lands within the Sage-grouse Cumulative Impact Analysis Area

Infrastructure Within Administrative Boundaries	Bruneau Field Office	Burley Field Office	Jarbidge Field Office	Tuscarora Field Office	Wells Field Office	Jarbidge Ranger District	Mountain City Ranger District
# of Allotments	37	104	98	29	32	23	49
Fence (miles)	527	387	2,824	31	392	178	363
Fence density (miles/mile^2)	0.49	1.12	1.17	0.94	0.64	0.47	0.76
Pipeline (miles)	50	138	900	0	99	76	11
Pipeline density (miles/mile^2)	0.05	0.40	0.37	0	0.16	0.20	0.02

The BLM manages livestock grazing on the portion of the Saylor Creek Training Range outside the exclusive use area. Livestock grazing on the Juniper Butte Training Range is administered by the Air Force. The miles of fence or pipeline are not given for the Juniper Butte Training Range. The Idaho Department of Lands (IDL) administers grazing for Idaho State lands under their jurisdiction. In many cases State lands are fenced in with Federal land and grazed at the same time as the Federal land. However, in some cases the State lands are fenced separately and grazed under the terms of the State lease.

Livestock grazing occurs on and is expected to continue on most Federal and State lands in the planning area and adjoining areas. Livestock numbers are expected to increase or remain static on private lands and to remain static on adjoining public lands. Livestock grazing on private lands where it presently occurs is expected to continue. Division of ranches into small 5- to 10-acre ranches has occurred on a limited basis, primarily in the Burley Field Office in the Rock Creek area.

Transportation and Travel

Paved roads accessing public lands include US Highway 93, Idaho Highway 51, Rock Creek Road, and the Rogerson Highway to Murphy Hot Springs. Numerous county roads are paved in Cassia, Elmore, Owyhee, and Twin Falls Counties in Idaho, and Elko County in Nevada. Paved roads are more abundant near more populated areas. The Bruneau Three Creek Road passes through parts of the Saylor Creek Training Range. Total miles of routes in the Cumulative Impact Analysis Area for sage-grouse are listed in Table 4-191. Routes were not further refined because classification varied between offices.

Table 4-191. Routes within the Administrative Boundaries on Federal Land within the Sage-grouse Cumulative Impact Analysis Area

Infrastructure Within Administrative Boundaries	Bruneau Field Office	Burley Field Office	Jarbidge Field Office	Tuscarora Field Office	Wells Field Office	Jarbidge Ranger District	Mountain City Ranger District
Routes – all types (miles)	1,400	1,006	5,086	29	777	234	554
Route density (miles/mile^2)	1.29	1.76	1.80	0.87	1.26	0.62	1.16

There are several public roads through part of the Saylor Creek Training Range. Other routes are present because of infrastructure. The exclusive use area blocked some older routes, which now get limited use. The Sawtooth National Forest and Jarbidge Ranger District have completed Travel Management Plans. Travel in these areas is limited to existing routes. The Omnibus Public Lands Management Act of 2009 (OPLMA) limited motorized vehicle use on BLM-managed lands in Owyhee County to existing routes. During transportation planning required by OPLMA, routes would be designated which may change the miles of routes in specific areas. To the east the majority of the Burley planning area is open to motorized vehicle use. However, in the South Hills some Burley routes have seasonal closures to protect big game winter range. The Jarbidge and Twin Falls Ranger Districts and BLM-managed lands in the Wells (NV) Field Office remain open to cross-country motorized vehicle use. Roads can result in some special status wildlife mortality through collisions with vehicles.

Road districts, county road departments, and the BLM and Forest Service will continue to maintain roads. Routes that receive higher use may be improved and existing roads widened. New routes from Nevada into the planning area and vice a versa have been created by various users. By designating the bulk of the planning area as limited to existing routes, off-highway vehicle use in northern Nevada adjacent to the planning area may increase. The creation of new routes in Nevada would damage habitat and in some areas extend routes into Idaho.

Land Use Authorizations

Rights-of-way (ROWs) have been issued by BLM offices for roads, power distribution lines, power transmission lines, telephone lines, fiber optic cables, communications sites, and oil/gas pipelines. A few ROWs have been in places for many decades, but others are recent. In general power distribution lines are more concentrated in suburban and urban areas. Communication sites are generally located in urban areas and along major roads, with a few in remote areas. The Air Force has ROWs for electric power to both the Saylor Creek and Juniper Butte Training Ranges. The Forest Service has some ROWs crossing BLM lands on roads leading to National Forest lands. IDL issues land use authorizations for a variety of purposes including: fences, pipelines, communications sites, etc. Several major transmission lines run through the analysis area. They have been in place for decades. There are proposals to widen existing corridors and create some new corridors.

Several small wind energy projects have been constructed on private land in the Bell Rapids, Cassia Gulch, Yahoo, and Magic Waters areas south and west of Hagerman. To date approximately 110 wind turbines have been installed. The BLM has processed some of ROWs for roads and transmission lines where they crossed public land connecting developments on private land. None of the land use authorizations associated with wind energy in the northern portion of the planning area are within 13 miles of an occupied sage-grouse lek. Wind turbines have also been installed at other sites in the cumulative impacts analysis area on private land in Cassia County west of Burley near Milner Butte. The Milner Butte project is about four miles north of a sage-grouse lek which was active when checked in 2006.

Utility Right-of-Way Corridors

Portions of the Gateway West energy corridor proposed routes run through the cumulative effects area and includes portions of the Bruneau, Burley, and Four Rivers Field Offices. In the planning area one route would be near Lilly Grade and then run north on the west side of Salmon Falls Creek to the Blue Gulch area then east across the northern portion of the planning area. Because the corridor is buffered for the cumulative effects analysis portions of the Bruneau and Four Rivers are included. The other route through the planning area would cross Salmon Falls Creek near Balanced Rock and then run northward and follow the same route across the northern portion of the planning area. Routes through the Burley, Jarbidge, and Wells (NV) Field Offices would cross some sage-grouse habitat. The route would pass over a number of wildlife and special status areas. The proposed Gateway route was buffered at one mile, three miles, and five miles from centerline to capture possible large scale impacts. Selected wildlife species for each office are listed in Table 4-192. The proposed route may be adjusted in the Final EIS which would have more specific detail regarding the corridor and alternatives.

Table 4-192. Selected Special Status Wildlife Habitat Components within the Proposed Gateway Corridor for Administrative Areas within the Sage-grouse Cumulative Impact Analysis Area

Habitat Components	Distance from Corridor Centerline		
	1 mile	3 miles	5 miles
Bruneau Field Office			
Sage-grouse leks (occupied and unknown)	1	1	1
Prairie falcon sites	0	0	0
Ferruginous hawk sites	40	58	65
Pygmy rabbit sites	0	0	0
Spotted bat sites	0	1	1
Townsend's big-eared bat sites	0	0	1
Habitat burned within corridor from 1987-2011 (acres)	1,300	1,900	4,100
Burley Field Office			
Sage-grouse leks (occupied and unknown)	1	4	17
Prairie falcon sites	0	0	0
Ferruginous hawk sites	19	45	61
Pygmy rabbit sites	5	5	6
Spotted bat sites	5	8	13
Townsend's big-eared bat sites	2	3	5
Occupied bighorn sheep habitat (acres)	200	2,500	8,300
Habitat burned within corridor from 1987-2011 (acres)	2,400	9,600	17,300
Four Rivers Field Office			
Sage-grouse leks (occupied and unknown)	0	0	0
Prairie falcon sites	7	14	14
Ferruginous hawk sites	12	12	28
Pygmy rabbit sites	0	0	0
Spotted bat sites	0	2	3
Kit fox	0	1	1
Bruneau Dunes tiger beetle sites	0	4	56

Habitat Components	Distance from Corridor Centerline		
	1 mile	3 miles	5 miles
Four Rivers Field Office			
Habitat burned within corridor from 1987-2011 (acres)	9,100	18,300	22,000
Jarbidge Field Office			
Sage-grouse leks (occupied and unknown)	0	3	12
Prairie falcon sites	15	20	25
Ferruginous hawk sites	24	50	68
Yellow-billed cuckoo sites	0	1	1
Pygmy rabbit sites	2	2	8
Spotted bat sites	3	3	3
Townsend's big-eared bat sites	0	0	1
Bruneau Dunes tiger beetle sites	6	6	6
Habitat burned within corridor from 1987-2011 (acres)	45,724	137,800	227,600

Southwest Intertie Project (SWIP) is proposed to expand the existing utility ROW to accommodate more high voltage electrical transmission lines. Physically SWIP is present within the Burley and Wells (NV) Field Office boundaries. However, SWIP lies close (less than one mile) to the planning area. Additional transmission lines in the corridor may influence wildlife in the planning area. For analyses, the corridor was buffered at distances of one, three, and five miles from centerline to determine a variety of wildlife parameters within the corridor. A number of wildlife features lie within the SWIP corridor. SWIP encompasses some sage-grouse habitat. A small amount of occupied bighorn sheep habitat is present in Nevada. No spotted frog habitat lies within the SWIP corridor. Additional transmission lines in the corridor may contribute to collision mortality of avian species and indirectly influence predation and nesting success on sage-grouse due to additional perches for foraging raptors and ravens.

Table 4-193. Selected Special Status Wildlife Habitat Components within the Proposed Southwest Intertie Project Corridor for Administrative Areas – All Ownerships within the Sage-grouse Cumulative Impact Analysis Area

Wildlife Parameter	Distance from Centerline		
	1 mile	3 miles	5 miles
Burley Field Office			
Sage-grouse leks (occupied and unknown)	4	23	48
Sharp-tailed grouse leks (occupied and unknown)	2	4	4
Prairie falcon sites	0	0	0
Ferruginous hawk sites	4	14	45
Spotted bat sites	1	3	10
Townsend's big-eared bat sites	0	0	1
Pygmy rabbit sites	0	5	7
Bighorn sheep habitat (acres)	0	0	3,600
Habitat burned within corridor from 1987-2011 (acres)	9,700	22,100	29,600
Jarbidge Field Office			
Sage-grouse leks (occupied and unknown)	0	2	9
Peregrine falcon sites	0	0	0
Prairie falcon sites	0	0	0
Ferruginous hawk sites	0	0	0
Bald eagle observations	0	0	0
Spotted bat sites	0	0	0
Townsend's big-eared bat sites	0	0	0
Pygmy rabbit sites	0	0	0

Wildlife Parameter	Distance from Centerline		
	1 mile	3 miles	5 miles
Jarbidge Field Office			
Bighorn sheep habitat (acres)	0	0	0
Habitat burned within corridor from 1987-2011 (acres)	0	0	1,200
Wells Field Office			
Sage-grouse leks (occupied and unknown)	8	25	40
Prairie falcon sites	0	2	5
Ferruginous hawk sites	0	1	1
Bald eagle observations	1	4	6
Spotted bat sites	0	0	0
Townsend's big-eared bat sites	0	1	1
Pygmy rabbit sites	0	0	0
Bighorn sheep habitat (acres)	2,200	11,900	30,800
Habitat burned within corridor from 1987-2011 (acres)	500	7,100	16,100

Renewable Energy Projects

Within the sage-grouse cumulative impacts analysis area, a number of small and large wind energy projects have been proposed on BLM, State, and private land. The majority of the private land is farmed or used for livestock grazing. It is not known if all the projects would be built. The Vertical Energy Wind Energy Project in the Bell Rapids area would be a small wind energy project incorporating several turbines on private land and three to four turbines on BLM land. Other future small wind projects on private land include: Magic Wind Park southeast of Bell Rapids, Baker #1 project southwest of Hammett, and Black Mesa Wind Park southeast of Glenns Ferry. The majority of the private land in Baker #1, Black Mesa, and Magic Wind Park is presently farmed.

Table 4-194. Proposed Wind Energy Projects within the Sage-grouse Cumulative Impact Analysis Area

Administrative Unit	Project Name	Distance from Planning Area Boundary (Miles)	Nearest Lek from Project (Miles)	Leks within 3 Miles	Leks within 5 Miles
Bruneau Field Office	Bruneau	6	10	0	0
	Wickahoney	18	1	8	27
	Wickahoney - Miller Creek	17	1	9	23
Burley Field Office	Amsterdam	2	3	1	2
	Jackpot	8	1	9	16
	Kimberly	18	1	5	17
	Project 2	14	1	6	13
Jarbidge Field Office	Baker #1 (Private)	Within	10	0	0
	Black Mesa(Private)	Within	15	0	0
	Corral Creek Hydro	Within	3	1	39
	Magic Wind (Private)	Within	13	0	0
	Vick	Within	14	0	0
	Vertical Energy	Within	15	0	0
Jarbidge and Wells Field Offices	China Mountain	Within	0	9	27

Administrative Unit	Project Name	Distance from Planning Area Boundary (Miles)	Nearest Lek from Project (Miles)	Leks within 3 Miles	Leks within 5 Miles
Wells Field Office	Wilkins - Gollaher Mountain	25	3	1	1

A feasibility proposal for the Corral Creek Hydro facility was submitted to the Federal Energy Regulatory Commission. The available information indicates the project would consist of a dam located on private land at the head of China Creek, a large diameter pipe crossing BLM land, a generator and second reservoir located on State or private land on Brown's Bench. A transmission line would run from the project area east across Salmon Falls Creek to connect with the major transmission line. Two occupied and one unknown sage-grouse leks are within five miles of the project area. An increase in infrastructure and human disturbance would occur during construction and to a lesser extent project operation.

The China Mountain Wind Energy Project has been proposed. It would place 160 to 190 turbines on BLM and private land around the China Mountain area in southeastern portion of the planning area and northern Nevada. If the project proceeds it would occupy several thousand acres of higher elevation late brood and winter sage-grouse habitat on BLM, State, and private lands. In the project area, roads, power lines, buildings, and turbines would increase the amount of routes and human disturbance during construction and to a lesser extent project operation. A transmission line would run from the southern portion of the project area eastward to a major transmission line.

Minerals

Gravel pits would continue to be used primarily by road districts. Several of the gravel pits have glass, cans and other debris left by target shooters. Use of the existing gravel pits would likely continue until the gravel seam is depleted at which time a new source would be developed.

Numerous mining claims for gold and other locatable minerals are present in the cumulative impact analysis area for sage-grouse. Mines were active in the Jarbidge and Contact areas of northern Nevada. Gold was also mined in a few areas along the Snake River. All but one of the jasper claims in the Bruneau River Canyon near Indian Hot Springs were relinquished in 2012. The remaining claim lies within designated Wilderness and Wild and Scenic River in the Bruneau Canyon. The claim includes small portions of the Bruneau and Jarbidge Field Offices. The BLM would continue to work with the claim holder to have the remaining claim relinquished.

ACECs

The Salmon Falls Creek ACEC is shared with the Burley Field Office. The Bruneau-Jarbidge ACEC ends at the Bruneau River which forms the boundary between the Bruneau and Jarbidge Field Offices. No other ACECs are shared with other planning areas. Since 1989 the ACEC has been managed to minimize infrastructure and disturbance maintaining habitat for prairie falcon and a variety of special status bats.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

None of the alternatives would restrict military uses of the air space or the training ranges. The No Action Alternative would result in continued loss of sagebrush steppe and mountain mahogany/mountain shrub group habitats from large wildland fires. New land use plans in the adjoining BLM field offices may be influenced by current management (Transportation and Travel, ACECs) within the planning area. Land use plan amendments to include new sage-grouse management direction are expected to enhance wildland fire suppression priority, include sagebrush in emergency stabilization and burned area rehabilitation (ES&BAR) plans if sagebrush steppe habitat burns, and limit land use authorizations with tall structures in some areas, etc. Establishing shrubs in sage-grouse habitat and winter range would continue at the present rate. Livestock grazing would continue on Federal, State, and private land. Changes in animal unit months (AUMs) in some multiple use areas may result in additional fencing or

water developments. Portions of the planning area would remain open to cross-country motorized and mechanized travel. New routes would likely be created into the Wells (NV) Field Office and perhaps the Jarbidge Ranger District. The BLM would continue to issue or deny land use authorizations which could impact some developments, such as communications sites or renewable energy, on State and private land. Southwest Intertie Project (SWIP) and Gateway corridors would be finalized. Salable mineral use would increase to some extent. Should the discovery of gas or oil within the planning area occur, it would result in increased exploration in and adjacent to the planning area. The Burley Field Office would likely retain its portion of the present Salmon Falls Creek ACEC. It is unknown if the Bruneau Field Office would adopt an ACEC to protect bighorn habitat in the Bruneau Canyon south of the wilderness boundary.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas would increase habitat for sage-grouse, spotted frog, and other special status species found in the area. It is not known if restoration would keep pace with the conversion of sagebrush steppe to grassland. Wildland fire, long restoration periods, and increased infrastructure density make it unlikely there would be an increase in amount of habitat or distribution of special status wildlife. Overall, the No Action Alternative ranks second to the last for special status wildlife and their habitats. Adverse impacts would be minor to major in the long term at the landscape scale.

Cumulative Impacts from Alternative I

Land use plan amendments to include new sage-grouse management direction are expected to increase wildland fire suppression priority for sagebrush steppe, include sagebrush in ES&BAR plans if sagebrush steppe habitat burned, and limit land use authorizations with tall structures in some areas, etc. New land use plans in the adjoining BLM field offices may be influenced by management for Alternative I (Transportation and Travel, ACECs) within the planning area. Alternative I would better focus wildland fire suppression and restoration (ACECs and Vegetation Management Area [VMA] C) efforts within the planning area. Alternative I would establish shrubs in sage-grouse habitat and big game winter. Livestock grazing would continue on Federal, State, and private land. Changes in AUMs may result in additional fencing or water developments to alter livestock distribution. Little of the planning area would remain open to cross-country motorized and mechanized travel. It would be less likely that new routes would join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would continue to issue or deny land use authorizations which could impact some developments, such as communications sites or renewable energy, on State and private land. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to some extent. Impacts of oil or gas discovery would be the same as the No Action Alternative. The Burley Field Office would likely retain its portion of the present Salmon Falls Creek ACEC. The Bruneau Field Office may adopt an ACEC to protect bighorn habitat in the Bruneau Canyon south of the wilderness boundary. They may also create a new ACEC opposite the Lower Bruneau Canyon ACEC.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas would increase habitat for sage-grouse, spotted frog, and other special status species found in the area. It is not known if restoration would keep pace with the conversion of sagebrush steppe to grassland. Wildland fire, long restoration periods, and increased infrastructure density make it unlikely there would be an increase in amount of habitat or distribution of special status wildlife. Alternative I ranks as fourth most favorable for special status wildlife with minor adverse impacts in the long term at the landscape scale.

Impacts from Management Specific to Alternative II

Land use plan amendments to include new sage-grouse management direction are expected to increase wildland fire suppression priority for sagebrush steppe, include sagebrush in ES&BAR plans if sagebrush steppe habitat burned, and limit land use authorizations with tall structures in some areas, etc. The new plan amendment may be more restrictive than direction contained in Alternative II regarding wildland fire suppression, restoration, etc. New land use plans in the adjoining BLM field offices may be influenced by management in Alternative II (Transportation and Travel, ACECs) within the planning area. Alternative II would focus wildland fire suppression in VMAs A and B and restoration generally away from sagebrush

steppe habitats. A suppression focus in VMA B would help protect some of the drier sage-grouse habitat. The amount of sagebrush steppe protected would be negligible at the planning area scale. Establishing shrubs in sage-grouse habitat would have a reduced priority. Livestock grazing would continue on Federal, State, and private land. A large increase in AUMs would likely result in additional fencing or water developments to alter livestock distribution. The increase in AUMs may result in higher livestock numbers on State and private land. None of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations thereby increasing impacts to special status wildlife species and their habitat. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Exploration and development for oil and gas would be least restrictive in Alternative II. Impacts of gas or oil discovery to adjacent field offices would be similar to the No Action Alternative. Because no ACECs would be designated, the Burley Field Office would be more likely to drop its portion of the present Salmon Falls Creek ACEC. The Bruneau Field Office would have less incentive to create any ACECs in the Bruneau Canyon.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas probably would not keep pace with habitat loss for sage-grouse or other sagebrush steppe special status wildlife. Wildland fire and the greatest increased infrastructure density would likely decrease the amount of habitat or distribution of special status wildlife. Alternative II ranks as least favorable for special status wildlife with moderate to major long-term adverse impacts at the landscape scale.

Cumulative Impacts from Alternative III

Land use plan amendments to include new sage-grouse management direction are expected to increase wildland fire suppression priority for sagebrush steppe, include sagebrush in ES&BAR plans if sagebrush steppe habitat burned, and limit land use authorizations with tall structures in some areas, etc. The new plan amendment may be more restrictive than direction contained in Alternative III regarding wildland fire suppression, restoration, etc. New land use plans in the adjoining BLM field offices may be influenced by management in Alternative III (Transportation and Travel, ACECs) within the planning area. Alternative III would focus wildland fire suppression in VMA B and restoration in VMA D. Establishing shrubs in sage-grouse habitat would have high priority in ACECs and VMA D. Livestock grazing would continue on Federal, State, and private land. The second highest increase in AUMs would likely result in additional fencing or water developments to alter livestock distribution. Only 4,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations thereby increasing impacts to special status wildlife species and their habitat. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Like Alternative II, exploration and development for oil and gas would be minimally restrictive in Alternative III. Impacts of gas or oil discovery to adjacent field offices would be similar to the No Action Alternative. The Burley Field Office would likely retain its portion of the present Salmon Falls Creek ACEC. The Bruneau Field Office would have less incentive to create any ACECs in the Bruneau Canyon.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas probably would not keep pace with habitat loss for sage-grouse or other sagebrush steppe special status wildlife. Wildland fire and the second highest increase of infrastructure density would likely decrease amounts of habitat or distribution of special status wildlife. Overall Alternative III ranks as fifth for special status wildlife with minor adverse impacts in the long term.

Cumulative Impacts from Alternative IV

Land use plan amendments to include new sage-grouse management direction are expected to increase wildland fire suppression priority for sagebrush steppe, include sagebrush in ES&BAR plans if sagebrush

steppe habitat burned, and limit land use authorizations with tall structures in some areas, etc. The new plan amendment may be less restrictive than direction contained in Alternative IV regarding wildland fire suppression, restoration, etc. The more restrictive or specific direction would likely be retained. New land use plans in the adjoining BLM field offices may be influenced by management in Alternative IV (Transportation and Travel, ACECs) within the planning area. Alternative IV would focus wildland fire suppression in VMA C. Establishing shrubs in sage-grouse habitat would have high priority in ACECs and VMAs D and C. Livestock grazing would continue on Federal, State, and private land. Because State and BLM lands are comingled, the decrease in BLM AUMs would likely result in additional fencing or water developments on State land, so livestock could graze the State permitted AUMs. Some small permit holders may sell out. Ranches with sagebrush may burn sagebrush and plant grasses to maintain economic viability. Grazing infrastructure in the Inside Desert ACEC would be reduced. Only 4,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would be more likely to issue land use authorizations reducing impacts to potential developments on State and private land. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Alternative IV would close some areas in the southeastern part of the planning areas to exploration and development for oil and gas. Outside the closed areas seasonal restrictions would apply. If gas or oil were discovered within the planning area it could result in increased exploration in and adjacent to the planning areas. The Burley Field Office would likely retain its portion of the present Salmon Falls Creek ACEC. The Bruneau Field Office may adopt an ACEC to protect bighorn habitat in the Bruneau Canyon south of the wilderness boundary. They may also create a new ACEC opposite the Lower Bruneau Canyon ACEC.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance. Infrastructure would likely decrease in a few localized areas. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas would probably out pace habitat loss for sage-grouse or other sagebrush steppe special status wildlife. Active restoration and only slightly increased infrastructure density would likely increase the amount of habitat or distribution of special status wildlife over the long term. Overall Alternative IV ranks highest for special status wildlife and their habitat with minor to moderate benefits at the landscape scale in the long term.

Cumulative Impacts from Alternative V

Land use plan amendments to include new sage-grouse management direction would be expected to increase wildland fire suppression priority for sagebrush steppe, include sagebrush in ES&BAR plans if sagebrush steppe habitat burned, and limit land use authorizations with tall structures in some areas, etc. If the new plan amendment were less restrictive than direction contained in Alternative V, direction in Alternative V may be retained. New land use plans in the adjoining BLM field offices may be influenced by management in Alternative V (Transportation and Travel, ACECs) within the planning area. Alternative V would focus wildland fire suppression in VMAs C and B. Establishing shrubs in sage-grouse habitat would have high priority in ACECs and VMA C. Livestock grazing would continue on Federal, State, and private land. Alternative V would have the lowest level of AUMs for livestock. Only 1,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would likely continue issuing land use authorizations to individuals or businesses for access roads to developments on State and private lands. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Exploration and development for oil and gas would be less restrictive than Alternative IV. Should the discovery of gas or oil within the planning area occur, it would result in increased exploration in and adjacent to the planning area. The Burley Field Office would likely retain its portion of the present Salmon Falls Creek ACEC. The Bruneau Field Office may have incentive to create an ACEC in the Bruneau Canyon south of the wilderness designation.

Increases in power lines, renewable energy, fences, pipelines, etc. would be minimal, maintaining or reducing infrastructure density and human disturbance. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas probably would not keep pace with habitat loss for sage-

grouse or other sagebrush steppe special status wildlife. Continued wildland fire would likely decrease the amount of habitat and distribution of special status wildlife. Overall Alternative V ranks second highest for special status wildlife with minor to moderate beneficial impacts at the landscape scale in the long term.

Cumulative Impacts from Alternative VI (Proposed RMP)

Land use plan amendments to include new sage-grouse management direction are expected to increase wildland fire suppression priority for sagebrush steppe, include sagebrush in ES&BAR plans if sagebrush steppe habitat burned, and limit land use authorizations with tall structures in some areas, etc. The new plan amendment may be more restrictive than direction contained in Alternative VI regarding management for sage-grouse and wildland fire suppression, restoration, etc. The more restrictive direction would amend the RMP. New land use plans in the adjoining BLM field offices may be influenced by management in Alternative VI (Transportation and Travel, ACECs) within the planning area. Alternative VI would focus wildland fire suppression in VMA C and B. Establishing shrubs in sage-grouse habitat would have high priority in ACECs and VMAs D and C. Livestock grazing would continue on Federal, State, and private land. The fourth highest increase in AUMs would likely result in additional fencing or water developments to alter livestock distribution. Only 4,000 acres of the planning area would remain open to cross-country motorized vehicle use. New routes would not join to the Wells (NV) Field Office. Motorized use may increase in the Burley or Wells (NV) Field Offices. The BLM would likely continue issuing land use authorizations for access roads to developments on State and private lands. SWIP and Gateway corridors would be finalized increasing infrastructure density in some areas. Salable mineral use would increase to provide gravel for new projects, improved routes, and new routes. Alternative VI would have the smallest area open to the exploration and development for oil and gas, but most of the planning area would be available with seasonal restrictions. Should the discovery of gas or oil within the planning area occur, it would result in increased exploration in and adjacent to the planning area. The Burley Field Office would likely retain its portion of the present Salmon Falls Creek ACEC. The Bruneau Field Office would have less incentive to create any ACECs in the Bruneau Canyon.

Increases in power lines, renewable energy, fences, pipelines, etc. would increase infrastructure density and human disturbance in some areas. Restoration of sagebrush steppe, mountain shrub/mountain mahogany, and riparian areas may keep pace or exceed habitat loss due to wildland fire for sage-grouse and other special status wildlife in the long term. Alternative VI is third most favorable for special status wildlife with minor to moderate beneficial impacts at the landscape scale in the long term.

4.3.8. Noxious Weeds and Invasive Plants

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to noxious weeds and invasive plants:

- **Potential for introduction and spread of noxious weeds and invasive plants** – No current inventory for acres occupied by noxious weeds exists. Additionally, only acres dominated by invasive annual vegetation have been quantified for the planning area. Acres where invasive plants are present, but not dominant, have not been quantified. Therefore, management actions are assessed for potential to decrease or increase acres occupied by noxious weeds and invasive plants.
- **Potential for control, containment, or eradication of noxious weeds and invasive plants** – In some cases, management actions might lead to control, containment, or eradication.
- **Potential for conversion of perennial communities to annual communities dominated by invasive plants** – Management actions affecting acres dominated by invasive annual grasses and resulting in conversion from the Annual vegetation sub-group (VSG) to other VSGs are discussed in the *Upland Vegetation* section.

Methods and Assumptions

Impacts to noxious weeds and invasive plants from management in the following sections of Chapter 2 were analyzed in detail: *Noxious Weeds and Invasive Plants*, *Upland Vegetation*, *Wildland Fire Ecology*

and Management, *Livestock Grazing*, *Transportation and Travel*, *Land Use Authorizations*, *Minerals*, and *Areas of Critical Environmental Concern*. Management in the *Soil Resources* section proposed in all alternatives focuses on minimizing or mitigating impacts to soils from various uses. These actions would generally reduce the potential for invasion and spread of noxious weeds and invasive plants, but are not expected to result in measureable changes at the planning area scale. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for noxious weeds and invasive plants. Impacts from management for noxious weeds and invasive plants can be found under *Impacts from Noxious Weeds and Invasive Plants Actions* in the *Upland Vegetation*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Plants*, *Special Status Fish and Aquatic Invertebrates*, and *National Historic Trails* sections.

Introduction and spread of noxious weeds and invasive plants into vegetation communities causes negative impacts to native plant community composition. Noxious weeds and invasive plants are known to displace native plants and disrupt the structure and function of local ecosystems (Vitousek, 1990). As noxious weed and invasive plant populations increase in size and frequency, they tend to reduce the diversity of surrounding native plant communities, altering the composition and community structure, the habitat quality in the infested area, recreational opportunities, and the visual aesthetic quality of the landscape (USDA, 1998; Usher, 1988; Weiss and Murphy, 1998). These changes to native plant communities can alter ecosystem processes, including productivity, decomposition, hydrology, nutrient cycling, and disturbance patterns such as frequency and intensity of wildland fires (Quigley and Arbelbide, 1997).

A number of integrated land use planning steps are important for the management and control of noxious weeds (USDA, 1998). These include a systematic and on-going inventory, application of specific best management practices (BMPs) to reduce opportunities for new introductions and spread of noxious weeds and invasive plants, strategic planning of prioritized integrated treatments for management and control, post-treatment monitoring and adaptive management strategies, and collaboration on cooperative agreements with surrounding land management entities.

Due to the lack of quantitative or qualitative inventory data for noxious weeds and invasive plants, management actions were assessed primarily for their ability to reduce potential for noxious weed and invasive plant introduction and spread.

The following assumptions were used when analyzing effects of management actions on noxious weeds and invasive plants:

- Noxious weeds and invasive plants would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the planning area, recreational activities, wildlife and livestock grazing and movements, and surface-disturbing activities. It is assumed that the greater the opportunity for these activities to occur, the greater the risk of introducing or spreading noxious weeds and invasive plants.
- Conversely, reductions in acreage with potential for surface-disturbing activities would result in reduction in potential for introduction and spread of noxious weeds and invasive plants.
- Management actions that designate areas as open or available for cross-country motorized vehicle use, activities authorized for land uses, or mineral extraction have greater potential for soil-surface disturbance than management actions that designate areas as closed or unavailable. This is due to potential for increased infrastructure and access routes. However, the actual disturbance area might not be proportional to the size of areas identified for potential designation or development.
- Treatments would result in attainment of the stated objectives. Failed or partially-failed treatments would be identified through monitoring and re-treated utilizing adaptive management methods until the objectives are met.

Direct and Indirect Impacts

Impacts from Noxious Weeds and Invasive Plants Actions

The following indicators were used to analyze the impacts of Noxious Weeds and Invasive Plants actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants,
- Potential for control, containment, or eradication of noxious weeds and invasive plants, and
- Potential for conversion of perennial communities to annual communities dominated by invasive plants.

Impacts from Management Specific to the No Action Alternative

Management actions specific to the No Action Alternative provide no objectives or clear prioritization for inventory or control of noxious weeds. Invasive plants are not addressed under the No Action Alternative. It is unlikely that the No Action Alternative would reduce the potential for introduction or spread of noxious weeds and invasive plants. Occupied acreages and diversity of noxious weeds would likely continue to increase within the planning area.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide for a proactive inventory, collaborative control, and incorporation of BMPs and stipulations into BLM management activities, authorized uses, permits and leases to limit the introduction and spread of noxious weeds and invasive plants. The inventory would have the overall impact of quantifying existing conditions and providing a baseline for evaluation of risk for new introductions and spread of existing populations. An up-to-date inventory would also provide a basis for treatment prioritization. Appropriate prioritization, cooperative treatment, and incorporation of BMPs and stipulations would reduce risk of introduction and spread and increase potential for control or eradication of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative I

Alternative I would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 50,000 acres (3%) to meet objectives for noxious weeds and invasive plants. Management actions prescribed in Alternative I would reduce the risk of noxious weed and invasive plant introduction and spread by focusing treatments in high-disturbance areas (e.g., motorized and recreational access points, roadsides) and using proactive management activities, including eradication of new or small populations in special designation areas and important habitats. The achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Management Specific to Alternative II

Alternative II would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 50,000 acres (3%) to meet objectives for noxious weeds and invasive plants. Management actions prescribed in Alternative II would reduce the risk of noxious weed and invasive plant introduction and spread, but do not prioritize treatments in areas where potential for introduction is high. Therefore, the introduction and spread of noxious weeds and invasive plants in the vicinity of roads, recreation sites, stock driveways, or other high-use areas would occur. Since thresholds described by the Alternative II objectives to reduce cover of invasive plants are higher than for the other alternatives, the risk of spread in both native and non-native communities would be greater. This would increase the potential for conversion of perennial communities to annual.

Impacts from Management Specific to Alternative III

Alternative III would treat about 200,000 acres (15%) of the planning area to prevent the spread of noxious weeds and invasive plants. Alternative III would make the least progress of all the alternatives towards decreasing the introduction and spread of noxious weeds, as it prescribes the lowest level of treatment and focuses primarily on fuels reduction and, therefore, invasive plants. Management actions prescribed in Alternative III would reduce the risk of noxious weed and invasive plant spread by

prioritizing treatments in areas with high potential for introductions to occur (e.g., fuel breaks, areas with high wildland fire occurrence, roadsides). The lack of treatment priority for small or new introductions would result in spread to other areas, such as native communities not contained within a special designation area or identified as special status species habitat. The achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual.

Impacts from Management Specific to Alternative IV

Alternative IV would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 250,000 acres (18%) to meet objectives for noxious weeds and invasive plants. Based on stated objectives and projected treatment acres, Alternative IV would make the greatest progress of all the alternatives towards reducing the introduction and spread of noxious weeds and invasive plants and increasing the potential for control or eradication. Management actions prescribed in Alternative IV do not prioritize treatments in areas where potential for introduction is high. Therefore, the potential for the introduction and spread of noxious weeds and invasive plants in the vicinity of roads, recreation sites, stock driveways, or other high-use areas would occur. The treatment of small or new introductions, special designation areas, and important habitats would reduce potential for spread and maintain or improve vegetation community or habitat quality in these areas. The achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Management Specific to Alternative V

Alternative V would treat about 200,000 acres (15%) of the planning area to prevent spread and an additional 100,000 acres (7%) to meet objectives for noxious weeds and invasive plants. Management actions prescribed in Alternative V would reduce the risk of noxious weed and invasive plant introduction and spread, but do not prioritize treatments in areas where potential for introduction is high. Therefore, the introduction and spread of noxious weeds and invasive plants would occur in the vicinity of roads, recreation sites, stock driveways, or other high-use areas. Based on stated objectives, Alternative V would make intermediate progress towards the eradication of noxious weeds. The treatment of small or new introductions in special designation areas and important habitats would reduce the potential for spread and maintain or improve vegetation community and habitat quality in these areas. The achievement of objectives to reduce the cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would treat about 200,000 acres (15%) of the planning area to prevent the spread of noxious weeds and invasive plants. Management actions prescribed in Alternative VI would reduce the risk of noxious weed and invasive plant introduction and spread by focusing treatments in high-disturbance areas (e.g., motorized and recreational access points, roadsides) and using proactive management activities, including eradication of new or small populations in special designation areas and important habitats. The achievement of objectives to reduce cover of invasive plants would decrease the potential for conversion of perennial communities to annual, particularly in native communities.

Impacts from Upland Vegetation Actions

The following indicators were used to analyze the impacts of Upland Vegetation actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants,
- Potential for control, containment, or eradication of noxious weeds and invasive plants, and
- Potential for conversion of perennial communities to annual communities dominated by invasive plants.

Management actions for upland vegetation communities that result in changes between vegetation sub-group (VSGs) or successional stages within native VSGs would influence the potential for the introduction and spread of noxious weeds and invasive plants into upland vegetation communities. Vegetation treatments can include activities (e.g., burning and mechanical treatments such as drill-seeding) that

result in short-term soil surface disruption or create conditions that are conducive to the introduction and spread of noxious weeds and invasive plants (e.g., burning, mechanical treatments such as drill-seeding). Management actions that maintain or improve the cover of diverse perennial vegetation would generally increase competition and resistance of plant communities to the introduction and spread of noxious weeds and invasive plants (DiTomaso, 2000) and would result in long-term control, containment, or eradication.

Management actions that increase the cover of biological soil crusts would tend to decrease the potential for the introduction and spread of noxious weeds and invasive plants. Research has indicated biological soil crusts form a physical or chemical barrier to some species and reduce the potential for the establishment of some noxious weeds and invasive plants (Gelbard and Belnap, 2003; Kaltenecker et al., 1999).

Management actions related to areas dominated by invasive annual grasses would convert acreages from the Annual VSG to a native community or Non-Native Perennial VSG. Where invasive plants are dominant, management actions that would result in this type of conversion are analyzed in the *Upland Vegetation* section.

The effects of ungrazed reference areas are discussed under *Impacts from Livestock Grazing Actions*.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would increase the acreage of non-native perennial communities through the conversion of annual communities and removal of shrubs in non-native understory communities (see the *Upland Vegetation* section). Treatments to convert annual communities to perennial resulting in complete removal of existing vegetation would occur on less than 1% of the planning area. This would be accomplished following wildland or prescribed fire and in conjunction with chemical treatment and/or seeding perennial vegetation. Prescribed fire or mechanical treatments would remove shrub overstory from non-native understory and native shrubland communities on about 6% of the planning area.

Treatments that would convert annual to perennial communities would increase the potential for the introduction and spread of noxious weeds and invasive plants not controlled by chemical treatments in the short term. Treatments to accomplish this conversion would temporarily remove vegetative cover and result in some soil surface disturbance from seeding methods. The subsequent establishment of perennial plant communities would result in decreased potential for introduction and spread of noxious weeds and invasive plants in the long term. Use of competitive non-native perennial vegetation might not completely curtail the introduction and spread of some noxious weeds and invasive plants and complementary treatments would need to occur to enhance success (Carpinelli et al., 2004).

The removal of shrub overstory for conversion to grassland communities using prescribed fire or mechanical treatments would result in the short-term disruption of the plant community and some level of soil surface disturbance. This would increase the short-term potential for introduction and spread of noxious weeds and invasive plants in treatment areas. The removal of sagebrush can reduce competition and would also result in increased potential for introduction and spread of noxious weeds and invasive plants, particularly perennial, tap-rooted species, in the long term (Svejcar, 2003).

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction for the protection of existing vegetation and newly treated areas. This direction is intended to reduce or eliminate improper uses or over-allocation, particularly during vulnerable periods such as growing seasons, drought periods, or seeding establishment. These actions would reduce the short- and long-term potential for the introduction and spread of noxious weeds and invasive plants in treatment areas.

Impacts from Management Specific to Alternative I

Alternative I would increase the acreage of native shrubland through conversion of annual, non-native perennial, non-native understory, and native grassland communities (see the *Upland Vegetation* section). This would be accomplished through use of multiple tools including chemical, mechanical, and biological

treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing.

Treatments to convert annual communities to perennial grassland or shrubland communities would occur on about 3% of the planning area. The effects of burning, chemical, and mechanical treatments, including seeding and planting, would be similar to those described for the No Action Alternative. Biological treatments, such as the use of insect or fungal pests to control noxious weeds or invasive plants, would expand opportunities for control, containment, or eradication of noxious weeds and invasive plants without broad-scale removal of vegetation or soil surface disturbance.

Targeted grazing would result in localized removal of vegetation to reduce fine fuels as well as populations of noxious weeds and invasive plants. This would result in short- or long-term control, depending on the biology of the target plants. The effectiveness of targeted grazing for invasive annuals would be temporary and localized (Launchbaugh et al., 2008; Vallentine and Stevens, 1994). Targeted grazing in areas dominated by invasive annuals would need to be combined with other treatments (e.g., chemical, seeding with perennial plants) for long-term effect (Hempy-Mayer and Pyke, 2008).

Native shrubland would be restored on 26% of the planning area. Over the long term, the establishment of shrubs would diversify above- and below-ground structure and would increase the resistance of plant communities to the introduction and spread of noxious weeds and invasive plants (DiTomaso, 2000).

Reseeding areas disturbed by project construction, maintenance, or removal with a diverse mix of vegetation would reduce potential for introduction and spread of noxious weeds and invasive plants by establishing competitive vegetation in disturbed areas (DiTomaso, 2000). Since the use of competitive non-native perennial vegetation might not completely curtail the introduction and spread of some noxious weeds and invasive plants, complementary treatments would need to occur to enhance success (Carpinelli et al., 2004).

Management to maintain or improve the cover and composition of biological soil crusts in native grassland and shrubland communities would reduce the potential for the introduction and spread of noxious weeds and invasive plants in those communities.

Impacts from Management Specific to Alternative II

Alternative II would increase the acreage of non-native perennial communities through conversion of annual communities and removal of shrubs in non-native understory communities (see the *Upland Vegetation* section). This would be accomplished through use of multiple tools including prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing. Treatments to convert annual to perennial communities would occur on about 6% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be removed on about 1% of the planning area in the Non-Native Understory VSG. The effects of specific treatments would be similar to those described for the No Action Alternative and Alternative I, except herbicides would be used to kill shrubs in non-native understory communities. The lack of soil surface disturbance would decrease the potential for the introduction and spread of noxious weeds and invasive plants. The long-term impacts of shrub removal would be the same as those described for the No Action Alternative.

Reseeding areas disturbed by project construction, maintenance, or removal with grasses would reduce the potential for the introduction and spread of noxious weeds and invasive plants by establishing competitive vegetation in disturbed areas. The effects would be similar to those described for Alternative I; however, the diversity of resultant vegetation would be lower. This would result in a lower potential for resistance to the introduction and spread of noxious weeds and invasive plants compared to Alternative I.

Impacts from Management Specific to Alternative III

Alternative III would increase the acreage of non-native perennial and native shrubland communities through conversion of annual and native grassland communities (see the *Upland Vegetation* section). This would be accomplished through use of multiple tools including prescribed fire; chemical, mechanical, and biological treatments; seeding and planting; and targeted grazing. Treatments to convert annual communities to perennial communities would occur on about 5% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be removed on less than 1% of the planning area in the Non-Native Understory VSG utilizing prescribed fire, chemical, or mechanical treatments. The effects of specific treatments would be similar to those described for the No Action Alternative and Alternatives I and II.

Native shrubland would be restored on 15% of the planning area. Treatment effects would be similar to those described in Alternative I.

Vegetation on about 1% of the planning area would be removed to create unvegetated fuel breaks. This would be accomplished through use of prescribed fire, chemical, mechanical, or targeted grazing treatments. General effects of these treatments are described for the No Action Alternative and Alternative I. Complete lack of competitive plant or biological soil crust cover would increase potential for introduction and spread of noxious weeds and invasive plants. Maintenance of unvegetated fuel breaks would require repeated, integrated treatment to keep them from becoming conduits for introduction of noxious weeds and invasive plants to adjacent areas.

The effects of treatments on areas disturbed by project construction, maintenance, or removal to reduce wildland fire size and intensity would be dependent on methods and materials. The effects of potential treatments, including seeding to establish perennial vegetation and unvegetated fuel breaks are described above.

Impacts from Management Specific to Alternative IV

Alternative IV would increase the acreage of non-native understory and native shrubland communities through conversion of annual, non-native perennial, non-native understory, and native grassland communities (see the *Upland Vegetation* section). This would be accomplished through the use of multiple tools including prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing. Treatments to convert annual to perennial communities would occur on about 6% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be restored on 42% of the planning area. Treatment effects would be similar to those described in Alternative I, but would cover the greatest area of all alternatives. Treatments to restore non-native understory to native shrubland communities would occur on about 1% of the planning area and would include chemical or targeted grazing treatments to remove or reduce non-native perennial grasses followed by interseeding native understory grasses and forbs. These would result in short-term reductions in understory cover, including biological soil crusts, with increased potential for introduction and spread of noxious weeds and invasive plants. Over the long term, establishment of diverse native shrubland communities would diversify above- and below-ground structure and would result in decreased potential for introduction and spread of noxious weeds and invasive plants.

The effects of rehabilitating areas disturbed by project construction, maintenance, or removal with a diverse mix of native vegetation would be similar to those described for Alternative I. Management to maintain or improve cover and composition of biological soil crusts would reduce potential for introduction and spread of noxious weeds and invasive plants throughout the planning area.

Impacts from Management Specific to Alternative V

Alternative V would increase the acreage of non-native understory and native shrubland communities through conversion of annual, non-native perennial, and native grassland communities (see the *Upland Vegetation* section). This would be accomplished through the use of multiple tools including prescribed fire; mechanical and biological treatments; seeding and planting including interseeding existing perennial grassland communities; and removal of grazing. Treatments to convert annual to perennial communities would occur on about 3% of the planning area. The effects of burning, mechanical (including seeding and planting), and biological treatments would be similar to those described for the No Action Alternative and Alternative I. Since chemical treatments would only be used as a last resort, it is expected that effects due to chemical treatments would be minor.

Shrubs would be restored on 32% of the planning area. Treatment effects would be similar to those described in Alternative I.

The effects of rehabilitating areas disturbed by project construction, maintenance, or removal with a diverse mix of native vegetation would be the same as those described for Alternative IV.

The effects of management to maintain or improve cover and composition of biological soil crusts throughout the planning area would be the same as for Alternative IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would increase the acreage of non-native understory and native shrubland communities through conversion of annual, non-native perennial, non-native understory, and native grassland communities (see the *Upland Vegetation* section). This would be accomplished through the use of multiple tools including prescribed fire; chemical, mechanical, and biological treatments; seeding and planting, including interseeding existing perennial grassland or shrubland communities; and targeted grazing. Treatments to convert annual to perennial communities would occur on about 4% of the planning area. The effects of burning, chemical, mechanical (including seeding and planting), biological, and targeted grazing treatments would be similar to those described for the No Action Alternative and Alternative I.

Shrubs would be restored on 34% of the planning area. Treatment effects would be similar to those described in Alternative I, but would cover an area larger than the No Action Alternative and Alternatives I, II, III, and V. Treatments to restore non-native understory to native shrubland communities would occur on about 2% of the planning area and would include chemical or targeted grazing treatments to remove or reduce non-native perennial grasses followed by interseeding native understory grasses and forbs. These would result in short-term reductions in understory cover, including biological soil crusts, with increased potential for introduction and spread of noxious weeds and invasive plants. Over the long term, establishment of diverse native shrubland communities would diversify above- and below-ground structure and would result in decreased potential for introduction and spread of noxious weeds and invasive plants.

The effects of rehabilitating areas disturbed by project construction, maintenance, or removal with a diverse mix of native vegetation would be similar to those described for Alternative I. Management to maintain or improve cover and composition of biological soil crusts would reduce potential for introduction and spread of noxious weeds and invasive plants throughout the planning area.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants,
- Potential for control, containment, or eradication of noxious weeds and invasive plants, and
- Potential for conversion of perennial communities to annual communities dominated by invasive plants.

Fire can be used as a tool to reduce biomass associated with noxious weeds and invasive plants, but can also result in introduction and spread of those species (DiTomaso, 2000). Some invasive plants, such as cheatgrass, are fire-adapted, and burning can promote introduction and spread (Billings, 1994; Whisenant, 1990).

Four types of wildland fire management actions have the potential to affect noxious weeds and invasive plants: wildland fire suppression priorities, wildland fire suppression actions, post-fire emergency stabilization and burned area rehabilitation (ES&BAR), and fuels treatment actions.

Fire suppression priorities have been identified for each alternative. Locations within the planning area are designated as either critical or conditional suppression areas, depending on resource management priorities. Additional priorities have been identified to guide wildland fire suppression in the case of multiple starts. Areas identified for critical suppression would be less likely to burn and, subsequently, less likely to have increased potential for introduction and spread of noxious weeds and invasive plants.

Fire suppression actions would result in removal of vegetation through blading, cutting, or burning. These result in localized disturbances that would be small in scale from a landscape perspective and might be restricted for resource protection. These treatments would cause soil surface disturbance that creates physical openings in communities for noxious weeds or invasive plants. Use of fire retardant can result in short-term increases in nitrogen and phosphorus. This can affect vegetation community composition by creating conditions favorable for growth of annual plants (Larson and Duncan, 1982).

ES&BAR actions performed within three years of a wildland fire can assist natural re-vegetation through the protection of the burned area or result in changes in vegetation sub-groups (VSGs) through treatments including seeding and planting of native or non-native vegetation. Actions that result in VSG changes through ES&BAR are analyzed in detail under *Impacts from Upland Vegetation Actions*. Management of burned areas to promote natural re-vegetation following wildland fire would generally result in decreased potential for introduction and spread of noxious weeds and invasive plants.

Fuels treatment actions modify vegetation community composition and structure to reduce the potential for wildland fire spread. Fuels treatment actions are normally applied to manage vegetation and other resources including the wildland urban interface (WUI), cultural sites, and wildlife and special status species habitat. Actions that result in VSG changes through fuels reduction are analyzed in detail under *Impacts from Upland Vegetation Actions*.

The effects of wildland fire ecology and management actions were assessed based on critical suppression priorities and the decreased potential for acreages to burn, which would also decrease the potential for introduction and spread of noxious weeds and invasive plants. Suppression actions and fuels reduction measures such as fuel breaks were assessed for potential to result in soil surface disturbance, which would increase potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the entire planning area is under full suppression; therefore, there is no prioritization for wildland fire suppression activities. The lack of prioritization reduces the potential for critical resource needs to be identified and acted on in the event of multiple starts. There is a higher potential for large wildland fires under the No Action Alternative as compared to the action alternatives. There is also greater potential that areas treated for ES&BAR or restoration would burn or re-burn before becoming fully established. The No Action Alternative would perpetuate the current trend of increased introduction and spread of noxious and invasive plants through higher potential for continued wildland fire disturbance.

Impacts from Management Common to All Action Alternatives

The use of best management practices would reduce the unintentional introduction of noxious weeds and invasive plants through minimizing soil surface disturbance and careful placement of staging areas and base camps. Management actions common to all action alternatives provide a framework to reduce potential for resource loss and provide direction for vegetation treatment application and rest following treatment. These actions would generally reduce wildland fire-related disturbance and increase

vegetation treatment success, and thus would result in short- and long-term decrease in potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative I

Alternative I identifies 491,000 acres (36% of the planning area) as critical suppression areas with priorities in the WUI; the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, and Salmon Falls Creek Areas of Critical Environmental Concern (ACECs); and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative I, priority VSGs would be Native Grassland and Native Shrubland.

Critical suppression priorities would protect 46% of priority VSGs in the planning area prior to implementation of vegetation treatments and 41% of the planning area upon completion of treatments.

Fire management priorities for critical suppression would not fully protect native grassland and shrubland communities within the planning area. Native grassland would be relatively resilient if burned. However, burning results in a pulse of nitrogen that increases potential for noxious weed and invasive plant introduction and spread (Svejcar, 2003). Short-term reduction or removal of vegetation and biological soil crusts due to wildland fire or wildland fire suppression activities would also contribute to increased potential for introduction and spread of noxious weeds and invasive plants.

Allowing wildland fire to burn annual and non-native perennial communities within the perimeter of an active wildland fire would facilitate restoration of these communities to native shrubland. However, these areas would be at increased risk of invasion and spread of noxious weeds and invasive plants over the short-term until subsequent establishment of seeded perennial vegetation.

Approximately 11,000 acres of vegetated fuel breaks (less than 1% of the planning area) would be created under Alternative I. Fuel breaks placed to protect restoration and ES&BAR treatments would enhance the potential for treatment success and lessen the potential need for re-treatment due to subsequent wildland fire. However, fuel breaks also create linear disturbances that can facilitate introduction and spread of noxious weeds and invasive plants (Merriam et al., 2006). Actions to locate fuel breaks in existing disturbance corridors and to treat noxious weeds and invasive plants in fuels reduction projects would reduce this potential. The effects of fuels treatment methods are described under *Impacts from Upland Vegetation Actions.*

Soil surface disturbance associated with wildland fire suppression activities and facilities (see the *Soil Resources* section) would locally increase potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative II

Alternative II identifies 170,000 acres (12% of the planning area) as critical suppression areas with priorities in the WUI. Unburned patches of native and non-native perennial communities within the perimeter of an active wildland fire would be protected, while unburned annual communities would be allowed to burn. Based on suppression priorities in Alternative II, priority VSGs would be Native Grassland and Non-Native Perennial.

Critical suppression priorities would protect 9% of priority VSGs in the planning area prior to implementation of vegetation treatments and 8% of the planning area upon completion of treatments.

Fire management priorities under Alternative II provide low levels of protection to resources outside of the WUI. Native and non-native perennial grasslands would be relatively resilient if burned. Critical suppression priorities do not extend to native shrubland or non-native understory communities under Alternative II; therefore, these areas would be more likely to burn. Burned areas would be susceptible to increased potential for introduction and spread of noxious weeds and invasive plants as described in Alternative I. Allowing wildland fire to burn annual communities within the perimeter of an active wildland fire would facilitate conversion of these communities to non-native perennial; however, these areas would

be at risk for introduction and spread of noxious weeds and invasive plants over the short-term until subsequent establishment of perennial vegetation.

Approximately 13,000 acres of vegetated fuel breaks (less than 1% of the planning area) would be created under Alternative II. Fuel breaks would result in linear disturbance that would facilitate introduction and spread of noxious weeds and invasive plants. Integration of noxious weed and invasive plant treatments into fuels reduction projects would reduce this potential.

Soil surface disturbance associated with wildland fire suppression activities and facilities (see the *Soil Resources* section) would locally increase the potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative III

Alternative III identifies 476,000 acres (35% of the planning area) as critical suppression areas with priorities in the WUI, the Bruneau-Jarbidge and Salmon Falls Creek ACECs, and key sage-grouse habitat. Unburned patches of native and non-native perennial communities within the perimeter of an active wildland fire would be protected, while unburned annual communities would be allowed to burn. Based on suppression priorities in Alternative III, priority VSGs would be Native Shrubland, Native Grassland, and Non-Native Perennial.

Critical suppression priorities would protect 46% of priority VSGs in the planning area prior to implementation of vegetation treatments and 45% of the planning area upon completion of treatments.

Fire management priorities for critical suppression would not fully protect the priority VSGs within the planning area. Native grassland and non-native perennial communities would be relatively resilient if burned. The effects of burning perennial and annual communities within the perimeter of an active wildland fire would be the same as those described for Alternative I.

Alternative III contains the largest network of fuel breaks, placed in strategic locations to disrupt the continuity of fuels and to protect important resources such as sage-grouse and slickspot peppergrass habitat. Approximately 25,000 acres of vegetated fuel breaks (2% of the planning area) and 19,000 acres of unvegetated fuel breaks (1% of the planning area) would be installed under Alternative III. This action would reduce the potential for disturbance and associated risk of noxious weed and invasive plant introduction and spread associated with large wildland fires. However, it would also create a network of linear disturbance areas that can facilitate the introduction and spread of noxious weeds and invasive plants (Merriam et al., 2006). Treatment of noxious weeds and invasive plants in fuels reduction projects would reduce this potential. Effects of fuels treatment methods are described under *Impacts from Upland Vegetation Actions.*

Soil surface disturbance associated with wildland fire suppression activities and facilities (see the *Soil Resources* section) would locally increase the potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative IV

Alternative IV-A identifies 594,000 acres (43% of the planning area) as critical suppression areas and Alternative IV-B identifies 552,000 acres (40% of the planning area) as critical suppression areas, with priorities in the WUI; the Bruneau-Jarbidge, Inside Desert, Jarbidge Foothills, and Lower Bruneau Canyon ACECs; and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative IV, priority VSGs would be Native Grassland and Native Shrubland.

Critical suppression priorities under Alternative IV-A would protect 53% of priority VSGs in the planning area prior to implementation of vegetation treatments and 42% of the planning area upon completion of treatments; critical suppression priorities under Alternative IV-B would protect 50% and 40%, respectively.

The effects of wildland fire management and fuels reduction actions would be similar to those described for Alternative I. Critical suppression priorities would tend to reduce the risk of burning in native plant communities, which would reduce potential for post-wildland fire introduction and spread of noxious weeds and invasive plants.

Approximately 11,000 acres of vegetated fuel breaks (less than 1% of the planning area) would be created under Alternative IV. Fuel breaks placed along roads would increasing the width of disturbance and the associated potential for introduction and spread of noxious weeds and invasive plants (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003; Merriam et al., 2006). Additional discussion regarding effects of roads is found under *Impacts from Transportation and Travel Actions*.

Impacts from Management Specific to Alternative V

Alternative V identifies 1,041,000 acres (76% of the planning area) as critical suppression areas with priorities in the WUI; the Lower Bruneau Canyon, Middle Snake, and Sagebrush Sea ACECs; and key sage-grouse habitat. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative V, priority VSGs would be Native Grassland and Native Shrubland.

Critical suppression priorities would protect 88% of priority VSGs in the planning area prior to implementation of vegetation treatments and upon completion of treatments. Critical suppression priorities would tend to reduce the risk of burning in native plant communities to the greatest extent of all the alternatives. This would reduce potential for post-wildland fire introduction and spread of noxious weeds and invasive plants.

The effects of wildland fire management and fuels reduction actions would be similar to those described for Alternative I, except that there would be no new wildland fire suppression infrastructure. This would reduce the amount of localized disturbance and, thus, potential for introduction and spread of noxious weeds and invasive plants at those sites.

Approximately 7,000 acres of vegetated fuel breaks (less than 1% of the planning area) would be created under Alternative V. Fuel breaks placed along roads would increasing the width of disturbance and the associated potential for introduction and spread of noxious weeds and invasive plants (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003; Merriam et al., 2006). Additional discussion regarding effects of roads is found under *Impacts from Transportation and Travel Actions*.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI identifies 597,000 acres (44% of the planning area) as critical suppression areas with priorities in the WUI; the Lower Bruneau Canyon, Sandpoint, Upper Bruneau Canyon, and Salmon Falls Creek ACECs; Saylor Creek Herd Management Area; occupied habitat for slickspot peppergrass; critical habitat for bull trout; and the sage-grouse management area. Unburned patches of native grassland and native shrubland within the perimeter of an active wildland fire would be protected, while unburned annual and non-native perennial communities would be allowed to burn. Based on suppression priorities in Alternative VI, priority VSGs would habitat for bull trout be Native Grassland and Native Shrubland.

Critical suppression priorities would protect 48% of priority VSGs in the planning area prior to implementation of vegetation treatments and 47% of the planning area upon completion of treatments.

Fire management priorities for critical suppression would not fully protect the priority VSGs within the planning area. Native grassland and non-native perennial communities would be relatively resilient if burned. The effects of burning perennial and annual communities within the perimeter of an active wildland fire would be the same as those described for Alternative I. Critical suppression priorities would tend to reduce the risk of burning in native plant communities, which would reduce potential for post-wildland fire introduction and spread of noxious weeds and invasive plants.

Approximately 11,000 acres of vegetated fuel breaks (less than 1% of the planning area) would be created under Alternative VI. Fuel breaks placed to protect restoration and ES&BAR treatments would

enhance the potential for treatment success and lessen the potential need for re-treatment due to subsequent wildland fire. However, fuel breaks also create linear disturbances that can facilitate introduction and spread of noxious weeds and invasive plants (Merriam et al., 2006). Actions to locate fuel breaks in existing disturbance corridors and to treat noxious weeds and invasive plants in fuels reduction projects would reduce this potential.

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants,
- Potential for control, containment, or eradication of noxious weeds and invasive plants, and
- Potential for conversion of perennial communities to annual communities dominated by invasive plants.

Livestock grazing can alter herbaceous cover and influence species composition and structure of vegetation communities (Saab et al., 1995), including noxious weeds and invasive plants. The type and intensity of effects depends on factors such as type of livestock and grazing system used, including stocking rate, season of use, use levels, and location and density of livestock facilities (e.g., fences, water, salt). Effects can be due to herbivory or trampling and can be direct (e.g., removal of vegetation, trampling plants) or indirect (e.g., soil surface disturbance). Livestock can spread seed through their digestive system or by transporting seed attached to hair (DiTomaso, 2000). In some cases, targeted grazing can be applied to control or eliminate specific plants such as noxious weeds or invasive plants (Launchbaugh et al., 2008; Olson and Wallander, 1998).

Livestock grazing actions were evaluated based on potential to directly or indirectly reduce introduction and spread of noxious weeds and invasive plants. Specific actions, including assignment of grazing systems and forage allocations on an allotment level, would be addressed in implementation-level plans.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 1,412,000 acres (97% of the planning area) would be available for livestock grazing and 51,000 acres (3% of the planning area) would be unavailable.

The potential for introduction and spread of noxious weeds and invasive plants would be reduced in areas closed to grazing due to anticipated changes in plant communities where noxious weeds and invasive plants are not currently abundant or dominant (see the *Upland Vegetation* section). The absence of livestock would reduce the potential spread of noxious weed and invasive plant seeds by animals or activities associated with construction, use, and maintenance of livestock facilities. Existing established populations of noxious weeds and invasive plants would not likely decrease under grazing exclusion in these areas without active treatment. Invasive annuals would be reduced in ungrazed areas where they are not dominant due to anticipated increased cover of perennial plants and biological soil crusts.

Under the No Action Alternative, allocated animal unit months (AUMs) would range from a minimum of 200,000 under current conditions to a maximum of 260,000 if vegetation objectives are achieved. Livestock use would be expected to maintain or slightly increase the current level of noxious weed and invasive plant introduction and spread.

Authorization of temporary non-renewable (TNR) permits or an increase in AUMs due to increased forage production would result in decreased biological soil crust cover. Management actions that would incorporate wildlife forage and cover needs, or that would improve ecological condition to good or better, would tend to maintain or improve vegetation and biological soil crust cover and reduce the potential for the introduction and spread of noxious weeds and invasive plants. Livestock concentration areas including water and supplement locations, holding areas, stock driveways, and fence lines would be expected to be more vulnerable to noxious weed and invasive plant introduction and spread compared to surrounding areas due to removal of desirable vegetation and soil disturbance.

Increases in the miles of pipelines and fences and construction, installation, and maintenance of watering facilities including reservoirs, wells, troughs, and spring developments can result in both linear disturbance corridors due to access needs, and a zone of disturbance that radiates out from the watering location (Brooks and Berry, 2006; Lange, 1969; Rogers and Lange, 1971). Installation and maintenance of pipelines results in linear disturbance from burial and, unless pipelines are installed along existing roads, the creation and maintenance of primitive roads through repeated use. This would create conduits for noxious weed and invasive plant introduction and spread (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003). Likewise, construction and maintenance of fences would have similar effects. Fence construction does not result in the same degree of soil disturbance as pipeline construction, but primitive roads often form on one or both sides of the fence due to maintenance and other uses. Repeated livestock trailing along fences can also create linear disturbances that may be vulnerable to noxious weed and invasive plant colonization. The size of the impacted area around watering sites depends on levels and consistency of use, but complete removal of vegetation damage to shrubs from trampling, and introduction and spread of noxious weeds and invasive plants can occur within a 50 to 100 foot radius of a watering site (Brooks and Berry, 2006; Vallentine, 2001). Similar effects can be found at locations where salt or supplements are offered. The potential for introduction of noxious weeds or invasive plants would be reduced by application of best management practices (Appendix B).

Actions that exclude livestock from reservoirs and springs and prohibit placement of salting, feeding, holding facilities, or stock driveways in riparian areas would reduce the potential for introduction and spread of noxious weeds and invasive plants in those areas.

Impacts from Management Common to All Action Alternatives

Management actions for livestock grazing common to all action alternatives provide direction and design criteria for implementation-level planning to reduce resource impacts. These actions would help maintain or improve vegetation cover and structure and would tend to reduce potential for introduction and spread of noxious weeds and invasive plants.

Implementation of drought management guidelines would be expected to retain adequate vegetation cover during periodic drought cycles and reduce vulnerability of plant communities to the introduction and spread of noxious weeds and invasive plants. Implementation of guidelines in the Aquatic and Riparian Management Strategy and minimizing disturbance at developed springs would be expected to reduce the potential for introduction and spread of noxious weeds and invasive plants in those areas.

Impacts from Management Specific to Alternative I

Under Alternative I, 1,389,000 acres (95% of the planning area) would be available and 74,000 acres (5% of the planning area) would be unavailable to livestock grazing. This would include areas in the Middle Snake Area of Critical Environmental Concern (ACEC) and Wildlife Tracts that would be restored from annual communities to native shrubland, and the Deadman/Yahoo Special Recreation Management Area which would be treated to convert annual communities to native grassland and non-native perennial communities. These areas occur within Vegetation Management Areas A and B and include some of the driest sites in the planning area. Because restoration treatments can be slow to establish in low precipitation zones, the potential for success of restoration treatments in these areas and long-term maintenance of restored native shrubland would be increased through minimizing the effects associated with livestock trampling and grazing (Stevens, 2004). Short- and long-term success of vegetation treatments would decrease the potential for introduction and spread of noxious weeds and invasive plants. The long-term effects of livestock exclusion would be the same as described for the No Action Alternative.

Under Alternative I, allocated AUMs would be dependent on production and would range from a minimum of 189,000[4] under current conditions to a maximum of 245,000 if vegetation objectives are achieved. Livestock allocations would be similar to those described for the No Action Alternative. However, since

[4] AUMs for the action alternatives are provided for analysis and comparative purposes only. See the *Livestock Grazing* section for more details on the basis for AUM calculations.

use would be allocated over about 3% fewer acres in the planning area, impacts would be spread over a slightly smaller area. This effect would be minor on the scale of the planning area.

Allocation of more than 60% of vegetation production for native and non-native perennial grass, shrub, and forb production to watershed and wildlife would promote landscape stability due to the retention of plant biomass and structure (Pellant et al., 2005). This would tend to reduce potential for introduction and spread of noxious weeds and invasive plants. Annual grass production is unpredictable and highly variable on an annual basis (Vallentine and Stevens, 1994). Allocation of annual grass production to livestock would result in greater use of perennial grasses in years when annual grass production is low. In years with high annual grass production, use would likely coincide with critical growing periods for perennial grasses, and would result in a reduction in cover and increased susceptibility for invasion of perennial communities by invasive annual grasses (Blaisdell and Pechanec, 1949; Chambers et al., 2007).

Estimated utilization levels to achieve resource and use objectives of 30% to 40% for native communities and 40% to 50% for non-native communities are generally considered to be of moderate intensity (Holechek, 1988; Holechek et al., 1998). These utilization levels would tend to maintain or decrease current levels of introduction and spread of noxious weeds and invasive plants. Utilization at the upper end of the ranges would tend to keep vegetation conditions static; utilization at the lower end of the ranges or below would be required for improvement (Holechek et al., 1999). Biological soil crusts are more sensitive to livestock disturbance than vascular plants and would likely be more abundant and diverse in native communities with lower utilization (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic heavy use (up to 70% every five years) in non-native communities would tend to leave communities vulnerable to introduction and spread of noxious weeds and invasive plants (Chambers et al., 2007; Ellison, 1960). Effects of targeted grazing are discussed under *Impacts from Upland Vegetation Actions*. The effects of TNR permits would be similar to those described for the No Action Alternative.

The number, type, and density of range infrastructure developments under Alternative I would be similar to the No Action Alternative; however, locations could be modified to meet resource objectives. The effects of range infrastructure developments would be similar to those described for the No Action Alternative.

Removal of fences would result in short-term disturbance due to access for removal of posts, wire, and other components. Long-term effects of fence removal to upland vegetation would be dependent on continued use of established primitive roads or trails by humans or livestock, but would include recovery of vegetation adjacent to the former fence line. Recovery would be facilitated by treatment of noxious weeds or invasive plants.

Impacts from Management Specific to Alternative II

Under Alternative II, 1,408,000 acres (96% of the planning area) would be available for livestock grazing and 55,000 acres (4% of the planning area) would be unavailable. The effects of livestock grazing exclusion would be the same as those described for the No Action Alternative.

Under Alternative II, allocated AUMs would range from 350,000 under current conditions to a maximum of 440,000, assuming vegetation objectives are achieved. Allocations would tend to promote retention of shrub and forb biomass. High allocation of annual grass production would provide substantial forage in years where growing conditions support annual grass production. However, this production is unpredictable (Vallentine and Stevens, 1994) and, as described for Alternative I, high allocation would result in over-use of perennial grasses in years when annual grasses are not abundant. In years with high annual grass production, use would likely coincide with critical growing periods for perennial grasses, and would result in a reduction in cover and increased susceptibility for invasion of perennial communities by annual grasses (Blaisdell and Pechanec, 1949; Chambers et al., 2007).

Estimated utilization levels to achieve resource and use objectives of 40% to 50% for native communities and 50% to 60% for non-native perennial communities are considered to be of moderate to high intensity (Holechek, 1988; Holechek et al., 1998). These utilization levels would tend to increase the potential for

the introduction and spread of noxious weeds and invasive plants. Utilization at the upper end of the ranges would tend to result in eventual degradation of plant communities; utilization at the lower end of the ranges would be necessary to maintain static conditions (Holechek et al., 1999). It is expected that biological soil crusts would be reduced in both cover and species abundance under moderate to high utilization (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic short-term heavy use (up to 70% every five years) is expected to have results similar to those described for Alternative I.

The effects of TNR permits, targeted grazing, and the installation, construction, and maintenance of grazing facilities would be similar to those described for Alternative I. It is expected that the number and density of all types of range infrastructure developments under Alternative II would increase compared to the other alternatives to accommodate increased vegetation allocations for livestock. This would increase potential for noxious weed and invasive plant introduction and spread due to higher density of disturbed areas.

The designation of reserve common allotments would provide flexibility for proactive treatments for noxious weeds and invasive plants. The ability to provide post-treatment rest would improve treatment success, reduce dominance of noxious weeds and invasive plants in localized areas, and reduce the potential for introduction and spread of noxious weeds and invasive plants into adjacent areas.

Impacts from Management Specific to Alternative III

Under Alternative III, 1,407,000 acres (96% of the planning area) would be available for livestock grazing and 56,000 acres (4% of the planning area) would be unavailable. The effects from closing areas to grazing would be the same as those described for the No Action Alternative.

The effects of vegetation allocations would be similar to those described for Alternative II. Under Alternative III, allocated AUMs would range from 273,000 under current conditions to a maximum of 348,000, assuming vegetation objectives are achieved. Allocations would tend to promote retention of shrub and forb biomass. Estimated utilization levels to achieve wildland fire and resource objectives are 30% to 40% for native communities and 50% to 60% for non-native perennial communities. The effects of utilization levels on native communities would be similar to those described for Alternative I; the effects of utilization levels on non-native communities would be similar to Alternative II. The effects of TNR permits, targeted grazing, and the installation, construction, maintenance, and removal of grazing facilities would be similar to those described for Alternative I; the effects of designating reserve common allotments would be similar to those described for Alternative II. It is expected that the number and density of all types of range infrastructure developments under Alternative III would increase compared to the No Action Alternative to accommodate increased vegetation allocations for livestock. This would increase potential for noxious weed and invasive plant introduction and spread due to higher density of disturbed areas.

Impacts from Management Specific to Alternative IV

Under Alternative IV-A, 1,324,000 acres (90% of the planning area) would be available for livestock grazing and 139,000 acres (10% of the planning area) would be unavailable; under Alternative IV-B 1,355,000 acres (93% of the planning area) would be available for livestock grazing and 108,000 acres (7% of the planning area) would be unavailable. Areas unavailable to livestock grazing include areas in the Inside Desert ACEC identified for restoration of non-native perennial communities to native shrubland. The effects on restoration treatments would be similar to those described in Alternative I. Long-term effects of making areas unavailable to livestock would be similar to those described for the No Action Alternative, but would occur over larger and more contiguous areas.

Allocated AUMs would be dependent on production. Under Alternative IV-A AUMs would range from a minimum of 78,000 to a maximum of 123,000, assuming vegetation objectives are achieved. Under Alternative IV-B, allocated AUMs would range from a minimum of 81,000 to a maximum of 151,000, assuming vegetation objectives are achieved.

Allocation of the majority (more than 70%) of vegetation production for native and non-native perennial grass, and all annual shrub, and forb production to watershed and wildlife would promote landscape stability due to retention of plant biomass and structure (Pellant et al., 2005) (see discussion in the *Upland Vegetation* section). This would tend to reduce potential for introduction and spread of noxious weeds and invasive plants.

Estimated utilization levels to achieve resource objectives of 20% to 30% for native communities and 30% to 40% for non-native communities are generally considered to be of light intensity (Holechek, 1988; Holechek et al., 1998). These utilization levels would tend to reduce potential for introduction and spread of noxious weeds and invasive plants. Utilization within these ranges, particularly at the lower end of the ranges or below would tend to result in improvement of vegetation community condition (Holechek et al., 1999) and reduce potential for invasion by noxious weeds and invasive plants (Chambers et al., 2007). Light utilization levels under Alternative IV would also tend to promote greater cover and species abundance for biological soil crusts (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001).

The effects of TNR permits would be similar to Alternative I. However, since TNR permits would not be allowed in pastures with more than 25% native communities (by cover), excluding Sandberg/non-native areas, the proportion of landscape affected would be less than in the No Action Alternative or Alternatives I, II, or III. Areas unavailable for TNR permits would increase with conversion of annual and non-native communities to native communities through vegetation treatment.

The effects of targeted grazing, and the installation, construction, maintenance, and removal of grazing facilities would be similar to those described for Alternative I; the effects of designating Reserve Common Allotments would be similar to those described for Alternative II. It is expected that the number and density of all types of range infrastructure developments under Alternative IV would decrease compared to the No Action Alternative due to decreased allocations. This would decrease potential for introduction and spread of noxious weeds and invasive plants due to lower density of disturbed areas.

Impacts from Management Specific to Alternative V

Under Alternative V, 1,160,000 acres (79% of the planning area) would be available for livestock grazing and 303,000 acres (21% of the planning area) would be unavailable. This would include areas in the Lower Bruneau Canyon and Middle Snake ACECs identified for restoration of annual and non-native perennial communities to native shrubland and non-native understory. Allocated AUMs would be dependent on production and would range from a minimum of 42,000 to a maximum of 93,000, assuming vegetation objectives are achieved. The effects on restoration treatments would be similar to those described in Alternative I. Long-term effects would be similar to those described for the No Action Alternative, but would occur over the largest and most contiguous areas of all the alternatives.

The effects of vegetation allocations in Alternative V would be similar to Alternative IV. There would be no TNR permits or targeted grazing under Alternative V, and forage on acquired lands and in allotments where permits are relinquished, sold, or cancelled would be held over the life of the plan for wildlife habitat and watershed protection. Alternative V would provide the greatest level of landscape stability due to retention of plant biomass and structure (Pellant et al., 2005) (see the *Upland Vegetation* section). This would tend to reduce potential for introduction and spread of noxious weeds and invasive plants. The effects of estimated utilization levels would be similar to Alternative IV, except utilization levels would likely be 10% to 20% in the Sagebrush Sea ACEC. This would include about 70% of the planning area and would promote the success of treatments to convert annual communities and native grassland to native shrubland by minimizing post-treatment effects associated with livestock trampling and grazing (Stevens, 2004). This would further reduce short- and long-term potential for introduction and spread of noxious weeds and invasive plants.

The effects of installation, construction, maintenance, and removal of grazing facilities would be similar to those described for the No Action Alternative, just over a lesser extent of the planning area. The lack of reserve common allotments under Alternative V would reduce flexibility for post-treatment rest of treated areas. It is expected that the number and density of all types of range infrastructure developments under

Alternative V would decrease substantially compared to the No Action Alternative to accommodate decreased allocations, especially in the Sagebrush Sea ACEC. Since no new pipelines would be authorized, Alternative V would reduce the potential for linear disturbance and introduction of noxious weeds and invasive plants throughout the planning area.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 1,406,000 acres (96% of the planning area) would be available and 57,000 acres (4% of the planning area) would be unavailable to livestock grazing. This would include areas in the wildlife tracts that would be restored from annual communities to native shrubland, Canyons associated with the Bruneau and Jarbidge Rivers and Salmon Falls Creek below the dam, reference areas, Salmon Falls Creek ACEC, and areas not contained within a grazing allotment. Short- and long-term success of vegetation treatments would decrease the potential for introduction and spread of noxious weeds and invasive plants. The long-term effects of livestock exclusion would be the same as described for the No Action Alternative.

Under Alternative VI, allocated AUMs would be dependent on production and other restrictions in place due to resource needs (e.g. sage-grouse habitat requirements, slickspot peppergrass restrictions). Initially a range of 216,000 AUMs up to 326,000 AUMs would be allocated with 186,000 AUMs to a maximum of 279,000 AUMs assuming vegetation objectives are achieved at full implementation. Livestock AUM allocations would be lower than those described for Alternatives II and III, but higher than Alternatives I, IV, and V. Although use would be allocated over about the same acreage in the planning area, impacts would be less intense resulting in less potential for spread of noxious weeds and invasive plants.

Allocation of more than 70% of vegetation production for native and non-native perennial grass, shrub, and forb production to watershed and wildlife would promote landscape stability due to the retention of plant biomass and structure (Pellant et al., 2005). This would tend to reduce the potential for introduction and spread of noxious weeds and invasive plants. Annual grass production is unpredictable and highly variable on an annual basis (Vallentine and Stevens, 1994). Allocation of annual grass production to livestock would result in greater use of perennial grasses in years when annual grass production is low. In years with high annual grass production, use would likely coincide with critical growing periods for perennial grasses, and would result in a reduction in cover and increased susceptibility for invasion of perennial communities by invasive annual grasses (Blaisdell and Pechanec, 1949; Chambers et al., 2007).

Estimated stocking from allocation of up to 40% for native communities and up to 45% for non-native communities are generally considered to be of moderate intensity (Holechek, 1988; Holechek et al., 1998). Estimated utilization levels resulting from these allocations would tend to maintain or slightly decrease current levels of introduction and spread of noxious weeds and invasive plants. Estimated utilization in Alternative VI would tend to keep vegetation conditions static or result in slight improvement (Holechek et al., 1999). Under moderate utilization levels proposed under Alternative VI biological soil crust cover and species diversity would be reduced (Ponzetti and McCune, 2001; Rogers and Lange, 1971; Warren and Eldridge, 2001). Periodic heavy use (up to 70% every five years) in non-native communities would tend to leave communities vulnerable to introduction and spread of noxious weeds and invasive plants. Effects of targeted grazing are discussed under *Impacts from Upland Vegetation Actions*. The effects of TNR permits would be similar to those described for the No Action Alternative.

Locations of existing facilities would be modified to meet resource objectives. Removal of fences would result in short-term disturbance due to access for removal of posts, wire, and other components which would increase the introduction and spread of noxious weeds and invasive plants. Long-term effects of fence removal would be dependent on continued use of established primitive roads or trails by humans or livestock, but would include recovery of vegetation adjacent to the former fence line. Recovery would be facilitated by treatment of noxious weeds or invasive plants. It is expected that the number and density of all types of range infrastructure developments would increase under Alternative VI compared to the No Action Alternative due to increased allocations. However, this increase would be limited by management actions for sage-grouse and slickspot peppergrass.

The effects of designating reserve common allotments would be similar to those described for Alternative II.

Impacts from Transportation and Travel Actions

The following indicator was used to analyze the impacts of Transportation and Travel actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants

Routes and route density can influence human-related disturbance including introduction and spread of noxious weeds and invasive plants (Gelbard and Belnap, 2003; Gelbard and Harrison, 2003). Changes in travel designation and seasonal restrictions can influence vegetation continuity and condition. Transportation and travel management actions were evaluated based on potential to reduce or increase the introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 25% of the planning area would be open to cross-country motorized vehicle use, 70% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The majority of the closed area is wilderness, where canyonland topography restricts travel. Under the No Action Alternative, it is expected that cross-country motorized use would increase and that additional unplanned routes would be created by repeated use. This would result in a long-term increase in route density within the planning area.

The No Action Alternative would result in increased potential for introduction and spread of noxious weeds and invasive plants. Cross-country motorized use and formation of new routes disrupts vegetation, biological soil crusts, and soil thereby creating openings for plant establishment to occur (Belnap and Eldridge, 2001; Gelbard and Belnap, 2003; Gelbard and Harrison, 2003; Masters and Sheley, 2001; Stohlgren et al., 2001). Increased route density would provide a greater density of disturbed areas for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction and protective mechanisms for route or use designations. These actions are not specific to management of noxious weeds and invasive plants. Direction for travel management planning would encourage consideration of noxious weeds in designation, modification, or closure of routes.

Impacts from Management Specific to Alternative I

Under Alternative I, less than 1% of the planning area would be open to cross-country motorized vehicle use, 91% would be limited to designated routes, and 8% would be closed to motorized vehicle use. Approximately 3,600 acres of the Deadman/Yahoo Special Recreation Management Area (SRMA), contained within the Deadman/Yahoo Travel Management Area (TMA), would be designated open to cross-country motorized vehicle use. This relatively small area currently has a high density of motorized use, which would be expected to continue under the open designation. This would result in areas with concentrated disturbance and high potential for introduction and spread of noxious weeds and invasive plants.

Route density is expected to decrease over approximately 48% of the planning area. This decrease would be focused in the Canyonlands, Jarbidge Foothills, and Snake River TMAs. Focus on increases in core habitat for mule deer in the Canyonlands and Jarbidge Foothills TMAs would tend to decrease the number and density of routes and associated human disturbance in native plant communities and reduce the risk of noxious weed and invasive plant introduction and spread. Approximately 49% of the planning area would retain the current level of route density, primarily in the Devil Creek TMA. Since the focus of this TMA would be to balance livestock grazing management needs with restoration activities, it is anticipated that route locations would continue to access existing livestock facilities and would be modified on establishment of new facilities. These routes would facilitate introduction of new noxious weeds and invasive plants and spread of existing populations into adjacent areas.

Actions that allow game retrieval within 300 feet of a designated route and access to camp sites within 25 feet of a designated route would result in disturbance of vegetation and soils that would increase potential for expansion of noxious weeds and invasive plants beyond the designated route corridor. Disturbance due to this cross-country motorized vehicle use would have the greatest effect on native shrublands due to crushing of shrubs and biological soil crusts. Exemptions on limitations or prohibitions to cross-country motorized use or use of closed routes would have effects similar to those described for the No Action Alternative.

Areas closed to motorized vehicle use would be free of the impacts associated with cross-country motorized vehicle use and roads described for the No Action Alternative. Closure would allow vegetation and biological soil crust recovery and would decrease the potential for noxious weed and invasive plant introduction and spread associated with human activities. However, these areas are small and isolated; therefore, effect would be minimal on the scale of the planning area.

Seasonal closures or restrictions on primitive roads, trails, and open areas would reduce the potential for human-caused fire. This would reduce the potential for wildland fire-associated introduction and spread of noxious weeds and invasive plants.

Implementation of best management practices (BMPs) to control noxious weeds and invasive plants in roadside areas would reduce the potential for introduction and spread in areas that would be open and limited to designated routes.

Impacts from Management Specific to Alternative II

Under Alternative II, none of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The lack of open designation would eliminate impacts described for the No Action Alternative and Alternative I.

Route density would be expected to increase in about 85% of the planning area, primarily within the Bruneau Desert TMA to facilitate access for commercial uses. The impacts of increased route density within the Bruneau Desert TMA would be similar to the impacts described for the No Action Alternative. Route density would be expected to remain the same in about 15% of the planning area, primarily within the Canyonlands TMA to facilitate livestock grazing with mitigation for impacts to resources. Impacts within the Canyonlands TMA would be similar to those described for the Devil Creek TMA in Alternative I.

Unlimited motorized access off designated routes for game retrieval and within 100 feet of a designated route for camp site access in areas not closed to motorized use would result in impacts similar to those described in Alternative I, but would apply to most of the planning area. Exemptions on limits or prohibitions to cross-country travel or use of closed routes would have effects similar to those described for the No Action Alternative.

The Bruneau-Jarbidge Rivers wilderness would be closed to motorized vehicle use under Alternative II; the canyon is physically restrictive to motorized transportation. The effects of closure would be the same as described for Alternative I. The effects of implementation of BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative III

Under Alternative III, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I.

Route density would be expected to increase in approximately 2% of the planning area, primarily within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to remain the same in about 98% of the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. These TMAs would be managed to improve access and facilitate wildland fire prevention and suppression. Management might not increase

route density, but would improve surface condition. Improvement of road condition would result in wider disturbance areas adjacent to roads due to maintenance activities, including mowing of roadside areas, and increased potential for introduction and spread of noxious weeds and invasive plants due to increased use (Gelbard and Belnap, 2003).

The lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites within 25 feet of a designated route would reduce off-road disturbance and associated potential for noxious weed and invasive plant introduction and spread relative to the No Action Alternative and Alternatives I and II. Exemptions on limitations or prohibitions to cross-country travel or use of closed routes would have effects similar to those described for the No Action Alternative.

Closed areas under Alternative III would be limited to the Salmon Falls Creek Area of Critical Environmental Concern (ACEC) and Bruneau-Jarbidge Rivers wilderness and canyons, which are physically restrictive to motorized transportation. The effects of these closures would be similar to those described for Alternative I.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative IV

Under Alternative IV, less than 1% of the planning area would be open to cross-country motorized vehicle use, 93% would be limited to designated routes, and 7% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman/Yahoo SRMA, which coincides with the Deadman/Yahoo TMA, would be similar to those described for Alternative I.

Route density would be expected to increase in approximately 2% of the planning area, primarily within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. The impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in approximately 98% of the planning area, primarily within the Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs. These TMAs would be managed for protection of sage-grouse and big game habitat and restoration activities while continuing to provide public access. Route reduction would tend to facilitate success of vegetation treatments by reducing potential for post-treatment human disturbance, as well as noxious weed and invasive plant introduction and spread.

The lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 25 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative and Alternatives I and II. Exemptions on limitations or prohibitions to cross-country travel or use of closed routes would have effects similar to those described for the No Action Alternative.

Closed areas under Alternative IV would include the Bruneau-Jarbidge Rivers wilderness and Lands with Wilderness Characteristics. The effects would be similar to those described for Alternative I, but would extend to a broader geographic area.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, less than 1% of the planning area would be open to cross-country motorized vehicle use, 88% would be limited to designated routes, and 12% would be closed to motorized vehicle use. The effects of designated open areas in the Yahoo SRMA, which coincides with the Yahoo TMA, would be similar to those described for Alternative I, but would be spatially reduced by about 80%.

Route density would be expected to increase in less than 1% of the planning area, primarily within the Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Yahoo TMA would be similar to impacts described for Alternative I, but would apply to less than 1% of the spatial area of Alternative I. Route density would be expected to decrease in approximately 99% of

the planning area, primarily within the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs. These TMAs would be managed for increasing core habitat size for sage-grouse and other special status species and accommodating restoration activities. Route reduction in Alternative V would do the most of all the alternatives to reduce potential noxious weed and invasive plant introduction and spread due to human disturbance.

Since the density of routes within the planning area would be reduced, lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 25 feet of a designated route would reduce off-road disturbance and associated potential for introduction and spread of noxious weeds and invasive plants to the greatest degree of all the alternatives. Application of motorized vehicle restrictions to everyone including lessees, BLM permit holders, and right-of-way holders would reduce the potential for cross-country motorized vehicle use to the greatest degree of all the alternatives and would eliminate most impacts associated with cross-country motorized vehicle use described in the No Action Alternative.

Closed areas under Alternative V would include wilderness, the Lower Salmon Falls Creek Wilderness Study Area (WSA), and Lands with Wilderness Characteristics. The effects would be similar to those described for Alternative I but would cover the largest geographic area of all the alternatives.

The effects of seasonal closures for wildland fire prevention and BMPs would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, less than 1% of the planning area would be open to cross-country motorized vehicle use, 95% would be limited to designated routes, and 5% would be closed to motorized vehicle use. The effects of designated open areas in the Deadman SRMA would be similar to those described for the Deadman Recreation Management Zone for Alternative I. The effects of seasonal closures for wildland fire prevention would be similar to those described for Alternative I.

Areas closed to motorized vehicle use in Alternative VI would be limited to the Salmon Falls Creek ACEC, the Lower Salmon Falls Creek WSA, Bruneau-Jarbidge Rivers Wilderness, and canyons which are physically restrictive to motorized transportation.

Route density would be expected to increase in about 3% of the planning area, including within the Deadman/Yahoo TMA to facilitate motorized recreational opportunities. Impacts of increased route density within the Deadman/Yahoo TMA would be similar to impacts described for Alternative I. Route density would be expected to decrease in about 10% of the planning area, primarily within the Jarbidge Foothills. Route density would remain unchanged within 87% of the planning area, primarily in the Canyonlands, Devil Creek, and Snake River TMAs. Route reduction and maintenance would tend to facilitate success of vegetation treatments by reducing potential for post-treatment human disturbance, as well as weed invasion and spread.

Lack of motorized access off designated routes for game retrieval and limiting motorized access to camp sites to within 100 feet of a designated route would reduce off-road disturbance relative to the No Action Alternative. Exemptions to motorized vehicle restrictions that allow cross-country motorized vehicle use would have effects similar to those described for the No Action Alternative.

Impacts from Land Use Authorizations Actions

The following indicator was used to analyze the impacts of Land Use Authorization actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants.

Land use authorizations, including road and utility rights-of-way (ROWs) and communication sites, typically have multiple components including infrastructure such as buildings, power transmission lines, meteorological towers, wind turbines, and roads for access. Activities associated with ROWs and

communication sites can result in areas of soil surface disturbance with the potential for noxious weed and invasive plant introduction and spread. Construction of infrastructure components typically includes road improvement for use by heavy equipment. Buried cable or pipelines would result in disturbance of soils from trenching as well as access roads. Authorizations would include clearing areas of vegetation around structures and gravelling to reduce wildland fire and provide parking.

Maintenance of facilities authorized by land use authorizations requires one or more access routes. Access routes may have a gravel or native surface, depending on the frequency, season, and type of maintenance needed. The effects of ROWs granted to provide access to Federal, State, and private land are usually limited to construction, use, and maintenance of roads. The relationship between noxious weeds and invasive plants and access routes for land use authorizations would be the same as described under *Impacts from Transportation and Travel*. All applications would be subject to detailed analysis on a case-by-case basis.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, utility ROW corridors are identified for 30,000 acres (2% of the planning area).

The No Action Alternative would restrict new communication sites to existing locations as much as possible. This would reduce potential for introduction and spread of noxious weeds and invasive plants by reducing soil surface disturbance associated with construction of access roads. Placement of communication sites at new locations would likely require new access roads and pads. At the landscape scale, impacts due to construction of new communication sites would be localized, but would provide entry points for noxious weed and invasive plant introduction and spread. The effects associated with access routes are described in detail under *Impacts from Transportation and Travel Actions.*

ROWs for roads, above-ground power transmission lines, buried power transmission lines or pipelines, or other linear facilities are highly variable regarding size of disturbance and type of access route. The effects regarding noxious weeds and invasive plants would be analyzed in more detail at the project level but would be similar to impacts described for buried pipelines under *Impacts from Livestock Grazing Actions* and roads in *Impacts from Transportation and Travel Actions*. Authorized agricultural uses or trespasses would locally increase the potential for noxious weed and invasive plant introduction and spread to adjacent areas. Implementation of best management practices (BMPs) for all special use permits, road use permits, and easements would reduce potential for introduction and spread of noxious weeds and invasive plants in stipulated areas and adjacent lands.

Under the No Action Alternative, expected wind energy development areas are identified for 111,000 acres, 8% of the planning area. Impacts of wind developments to soils would include excavation for placement of meteorological towers, turbines, substation and maintenance facilities, power transmission lines, and construction, use, and maintenance of roads. Construction, use, and maintenance of meteorological towers would locally increase potential for the introduction and spread of noxious weeds and invasive plants. Impacts related to construction, use, and maintenance of wind turbines, substation and maintenance facilities, and power transmission lines would be similar to impacts from meteorological towers but would be larger in scale. Specific impacts relative to noxious weeds and invasive plants would be analyzed in detail for individual projects. Impacts of construction, use, and maintenance of access roads would be the same as impacts described under *Impacts from Transportation and Travel Actions.*

Impacts from Management Common to All Alternatives

Use of BLM wind energy development program policies and BMPs would result in stipulated control of noxious weeds and invasive plants resulting from construction, maintenance and use of wind energy facilities.

Impacts from Management Common to All Action Alternatives

Management actions common to all alternatives would generally reduce potential for introduction and spread of noxious weeds and invasive plants by encouraging location of new ROWs and communication

sites within existing disturbed corridors or sites. This would reduce the number of new access roads and pads and the effects associated with those developments.

Impacts from Management Specific to Alternative I

Under Alternative I, utility ROW corridors consist of 53,000 acres (4% of the planning area). The effects of activities associated with construction, use, and maintenance of communication sites and ROWs relative to noxious weeds and invasive plants would be similar to those described for the No Action Alternative, but would occur over a slightly smaller geographic area.

Under Alternative I, expected wind energy development areas are identified on 39,000 acres (3% of the planning area). Impacts of wind developments relative to noxious weeds and invasive plants would be the same as those described for the No Action Alternative, but would potentially occur on 39% of the geographic area. Wind energy would be encouraged in areas with annual grassland or non-native perennial grass communities. These areas have been altered by wildland fire or other disturbances, resulting in changes in vegetation composition, including presence of noxious weeds and invasive plants. Implementation of BMPs for control of noxious weeds and invasive plants would reduce potential for introduction and spread to other areas as a result of construction, maintenance, or use of wind energy facilities.

Impacts from Management Specific to Alternative II

Under Alternative II, utility ROW corridors consist of 53,000 acres (4% of the planning area). The effects of activities associated with construction, use, and maintenance of communication sites and ROWs relative to introduction and spread of noxious weeds and invasive plants would be similar to those described for the No Action Alternative, but would occur over a slightly larger geographic area.

Under Alternative II, expected wind energy development areas are identified on 127,000 acres (9% of the planning area). Impacts of wind developments relative to noxious weeds and invasive plants would be the same as those described for the No Action Alternative, but would occur on a slightly larger geographic area.

Impacts from Management Specific to Alternative III

Under Alternative III, utility ROW corridors consist 53,000 acres (4% of the planning area). The effects of activities associated with construction, use, and maintenance of communication sites and ROWs relative to potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative I.

Under Alternative III, expected wind energy development areas are identified on 50,000 acres (4% of the planning area). Impacts of wind developments relative to noxious weeds and invasive plants would be the same as those described for Alternative I.

Impacts from Management Specific to Alternative IV

Under Alternative IV, utility ROW corridors consist of 53,000 acres (4% of the planning area). The effects of activities associated with construction, use, and maintenance of communication sites and ROWs relative to introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative I.

Under Alternative IV, expected wind energy development areas are identified on 37,000 acres (3% of the planning area). Impacts of wind developments relative to noxious weeds and invasive plants would be the same as those described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, utility ROW corridors consist 53,000 acres (4% of the planning area). The effects of activities associated with construction, use, and maintenance of communication sites and ROWs relative to noxious weeds and invasive plants would be the same as those described for Alternative I, but would occur over a slightly smaller geographic area.

Under Alternative V, expected wind energy development areas are identified on 31,000 acres (2% of the planning area). Impacts of wind developments relative to noxious weeds and invasive plants would be the same as those described for Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, utility ROW corridors consist of 43,000 acres, (3% of the planning area). The effects of activities associated with construction, use, and maintenance of communication sites and ROWs relative to potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative I, but would occur over fewer acres of the planning area.

Under Alternative VI, expected wind energy development areas are identified on 22,000 acres (2% of the planning area). Impacts of wind energy developments relative to noxious weeds and invasive plants would be the same as those described for Alternative I.

Impacts from Minerals Actions

The following indicator was used to analyze the impacts of Mineral actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants.

Activities associated with mineral leasing and development can result in areas of soil surface disturbance with the potential for noxious weed and invasive plant introduction and spread. Surface occupancy for leasable, salable, and locatable mineral extraction would include some or all of the following developments and activities: removal of surface vegetation, alteration of landforms, construction of new or use and maintenance of existing transportation routes, heavy equipment operations, presence of personnel, overhead powerlines, surface piping, access restrictions, and permanent structures.

The relationship between noxious weeds and invasive plants and access routes for all mineral resources would be the same as described under *Impacts from Transportation and Travel Actions*. Applications would be subject to detailed analysis on a case-by-case basis.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the majority of the planning area would be open for oil and gas leasing. In areas closed to development or open with no surface occupancy restrictions, there would be little potential for noxious weeds and invasive plant introduction and spread due to oil and gas exploration and development activities. Areas open and with potential for exploration and development would be more likely to have some level of disturbance resulting from vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. This would increase the potential for introduction and spread of noxious weeds and invasive plants within the designated open area. The relationship between the potential for introduction and spread of noxious weeds and invasive plants and access routes for minerals resources is the same as described under *Impacts from Transportation and Travel Actions*. According to the Reasonably Foreseeable Development Scenario (RFDS) for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing.

Under the No Action Alternative, the majority of the planning area would be open for geothermal leasing. Impacts would be the same as those described for oil and gas leasing. According to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur in the planning area as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing.

Under the No Action Alternative, the acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Individual sites would have

some level of disturbance due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. These locations would be prone to introduction of noxious weeds and invasive plants and use would facilitate spread to other areas.

Under the No Action Alternative, 60,000 acres (4% of the planning area) would be withdrawn from locatable mineral entry due to the Omnibus Public Lands Management Act of 2009 (OPLMA). About 84% of the planning area would have potential for some level of disturbance due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. It is unlikely that disturbance would be proportional to the area open for development due to the limited potential for locatable mineral discovery in the planning area; however, disturbed areas would be prone to introduction of noxious weeds and invasive plants and use would facilitate spread to other areas. Disturbed areas are expected to be small relative to the designated open area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Implementation of best management practices would reduce the potential for introduction and spread of noxious weeds and invasive plants in areas developed for leasable and salable mineral extraction. This would also reduce potential for spread to adjacent areas.

Impacts from Management Common to All Action Alternatives

Actions common to all action alternatives for salable minerals would stipulate control of noxious weeds and invasive plants in areas with ground disturbance. This would reduce the potential for use of these sites to facilitate spread of noxious weeds and invasive plants to other areas.

Impacts from Management Specific to Alternative I

Under Alternative I, 295,000 acres (22% of the planning area) would be open and have potential for oil and gas leasing. Impacts regarding the potential for noxious weed and invasive plant introduction and spread would be the same as those described for the No Action Alternative.

Under Alternative I, 352,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts regarding the potential for noxious weed and invasive plant introduction and spread would be the same as those described for the No Action Alternative.

Under Alternative I, 1,200,000 acres (88% of the planning area) would be open for salable mineral development. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Areas open for salable mineral development would have greater potential for introduction and spread of noxious weeds and invasive plants due to vegetation removal and disruption of soils for construction, use, and maintenance of facilities and roads. However, the disturbed area is expected to be small relative to the designated open area, based on current and anticipated demand for salable minerals. The relationship between potential for introduction and spread of noxious weeds and invasive plants and access routes for minerals resources are the same as described under *Impacts from Transportation and Travel Actions*.

Alternative I would recommend 69,000 acres (5% of the planning area) for withdrawal from locatable mineral development in addition to what was withdrawn through OPLMA. The effects of withdrawal would be the same as described for the No Action Alternative. The effects of locatable mineral extraction would be the same as those described for the No Action Alternative.

Impacts from Management Specific to Alternative II

Under Alternative II, 306,000 acres (22% of the planning area) would be open and have potential for oil and gas leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as for the No Action Alternative, but would potentially occur over an additional 4% of the planning area.

Under Alternative II, 365,000 acres (27% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts regarding the potential for introduction and spread of noxious

weeds and invasive plants would be the same as for the No Action Alternative, but would potentially occur over an additional 4% of the planning area.

Under Alternative II, 1,282,000 acres (93% of the planning area) would be open to salable mineral development. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 3,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as described for Alternative I, but would potentially occur over an additional 7% of the planning area.

Alternative II would recommend 26,000 acres, 2% of the planning area, for withdrawal from locatable mineral development in addition to what was withdrawn through OPLMA. The effects of withdrawal would be the same as described for Alternative I, but would occur over 66% less of the planning area. The effects of locatable mineral extraction would be the same as those described for the No Action Alternative.

Impacts from Management Specific to Alternative III

Under Alternative III, 302,000 acres (22% of the planning area) would be open and have potential for oil and gas leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative II.

Under Alternative III, 361,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative II.

Under Alternative III, 1,266,000 acres (92% of the planning area) would be open to salable mineral development, with the same levels of development expected as under Alternative II. This is approximately 0.2% of the area available for salable mineral development. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as described for Alternative I, but would potentially occur over an additional 5% of the planning area.

Alternative III would recommend 28,000 acres, 2% of the planning area, for withdrawal from locatable mineral development in addition to what was withdrawn through OPLMA. The effects of withdrawal would be the same as described for Alternative I, but would occur over 66% less of the planning area. The effects of locatable mineral extraction would be the same as those described for the No Action Alternative.

Impacts from Management Specific to Alternative IV

Under Alternative IV, 272,000 acres (20% of the planning area) would be open and have potential for oil and gas leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative I, but would potentially occur over 7% less of the planning area.

Under Alternative IV, 358,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as for Alternatives II and III.

Under Alternatives IV-A and IV-B, 1,103,000 acres (80% of the planning area) and 1,135,000 acres (83% of the planning area), respectively, would be open to salable mineral development, with the same levels of development expected as under Alternative I. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as described for Alternative I, but would potentially occur over 8% and 5% less of the planning area, respectively.

Alternative IV would recommend 83,000 acres (6% of the planning area) for withdrawal from locatable mineral development in addition to what was withdrawn through OPLMA. The effects of withdrawal would be the same as described for the Alternative I, but would occur over 17% more of the planning area. The

effects of locatable mineral extraction would be the same as those described for the No Action Alternative.

Impacts from Management Specific to Alternative V

Under Alternative V, 266,000 acres (19% of the planning area) would be open and have potential for oil and gas leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative IV.

Under Alternative V, 360,000 acres (26% of the planning area) would be open and have medium to high potential for geothermal leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative IV.

Under Alternative V, 1,162,000 acres (85% of the planning area) would be open to salable mineral development, with the same levels of development expected as under Alternative I. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as described for Alternative I, but would potentially occur over 3% less of the planning area.

Alternative V would recommend 33,000 acres (2% of the planning area) for withdrawal from locatable mineral development in addition to what was withdrawn through OPLMA. The effects of withdrawal would be the same as described for the Alternative I, but would occur over 52% less of the planning area. The effects of locatable mineral extraction would be the same as those described for the No Action Alternative.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 302,000 acres (22% of the planning area) would be open to surface occupancy and have potential for oil and gas leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as those described for Alternative I, but would potentially occur over an additional 4% of the planning area.

Under Alternative VI, 309,000 acres (23% of the planning area) would be open to surface occupancy and have medium to high potential for geothermal leasing. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as for Alternatives II and III.

Under Alternative VI, 1,250,000 acres (91% of the planning area) would be open to salable mineral development, with the same levels of development expected as under Alternative I. Impacts regarding the potential for introduction and spread of noxious weeds and invasive plants would be the same as described for Alternative I, but would potentially occur over 4% more of the planning area, respectively.

Alternative VI would not recommend any of the planning area for withdrawal from locatable mineral development beyond what has been withdrawn through OPLMA. The effects of locatable mineral extraction would be the same as those described for the No Action Alternative.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on noxious weeds and invasive plants:

- Potential for introduction and spread of noxious weeds and invasive plants and
- Potential for control, containment, or eradication of noxious weeds and invasive plants.

ACECs are designated to manage for identified relevant and important values, including upland and riparian vegetation, special status plants or animals, paleontological resources, or cultural resources. Management actions for relevant and important values are evaluated for potential to decrease introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to the No Action Alternative

Actions prescribed under the No Action Alternative would limit to some extent human and livestock use and developments that would result in surface-disturbing activities. This would have the general effect of reducing potential for introduction and spread of noxious weeds and invasive plants.

Impacts from Management Specific to Alternative I

Actions prescribed under Alternative I would generally reduce the potential for the introduction and spread of noxious weeds and invasive plants by reducing the amount and extent of surface-disturbing activities. Alternative I also includes specific management direction for integrated treatment of noxious weeds and invasive plants in the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, and Salmon Falls Creek ACECs that would enhance the potential for control, containment, and potentially eradication. Treatments in the Bruneau-Jarbidge ACEC would be prioritized for areas with concentrated recreational and livestock use. Inclusion of the stipulation for weed-free forage and straw would further reduce potential for introduction, particularly in high-use areas.

Impacts from Management Specific to Alternative II

Existing ACEC designations would be removed and no new ACECs would be designated. The effects described in the No Action Alternative would not occur.

Impacts from Management Specific to Alternative III

The effects of actions prescribed under Alternative III would be similar to those described for Alternative I for the Bruneau-Jarbidge and Salmon Falls Creek ACECs. Treatment priorities for the Bruneau-Jarbidge ACEC would extend to the entire ACEC, instead of focusing on areas of high use.

Impacts from Management Specific to Alternative IV

The effects of actions prescribed under Alternative IV would be similar to those described for Alternative I, but would apply to the Bruneau-Jarbidge, Inside Desert, Jarbidge Foothills, and Lower Bruneau Canyon ACECs. Treatment priorities in the Bruneau-Jarbidge ACEC would focus on areas with concentrated recreational and livestock use. Alternative IV-A would prioritize the greatest acreage for active integrated weed management compared to all other alternatives, followed by Alternative IV-B. The effects of closing areas to livestock grazing and motorized vehicle use on upland vegetation communities are described under *Impacts from Livestock Grazing Actions* and *Impacts from Transportation and Travel Actions*.

Impacts from Management Specific to Alternative V

The kinds of effects of actions prescribed under Alternative V would be similar to those described for Alternative I, but would apply to the Lower Bruneau, Middle Snake, and Sagebrush Sea ACECs. Alternative V would contain the greatest acreage of all alternatives identified for treatment. However, treatments in the Sagebrush Sea ACEC, which would comprise the majority of the area, would include passive methods, which would increase the time required for control, containment, or eradication.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The effects of actions prescribed under Alternative VI would be similar to those described for Alternative I for the Lower Bruneau Canyon and Salmon Falls Creek ACECs. The Upper Bruneau Canyon and Sand Point ACEC would generally reduce the potential for the introduction and spread of noxious weeds and invasive plants by managing to reduce the amount and extent of surface-disturbing activities and by being a priority for treatment under Alternative VI. The effects of Alternative VI would be similar to Alternative I but would occur over fewer acres than Alternative I, III, IV, and V.

Summary of Direct and Indirect Impacts

Alternatives were qualitatively rated based on the extent to which actions reduced the potential for noxious weed and invasive plant introduction and spread. Ratings are for comparison purposes only and are not meant to be additive by alternative or to provide a measure of significance between alternatives.

Impacts from the No Action Alternative

The No Action Alternative ranked seventh in reducing the potential for the introduction and spread of noxious weeds and invasive plants throughout the planning area. The No Action Alternative would do little to change current trends for noxious weeds and invasive plants through vegetation treatments, wildland fire management, travel management, or land use authorizations. The No Action Alternative contains the least potential for leasable, salable, and locatable mineral development compared to the action alternatives.

Overall, the No Action Alternative would result in minor adverse impacts to vegetation communities due to the limited amount of reduction in introduction and spread of noxious weeds and invasive plants.

Impacts from Alternative I

Alternative I ranked fourth for reducing the potential for the introduction and spread of noxious weeds and invasive plants. Management actions under Alternative I would tend to moderate disturbance to vegetation and soil resources while allowing for multiple uses.

Alternative I would result in minor beneficial impacts to vegetation communities due to the maintenance of current conditions with some potential for reduction in introduction and spread of noxious weeds and invasive plants over the long term.

Impacts from Alternative II

Alternative II would do the least to reduce the potential for the introduction and spread of noxious weeds and invasive plants. Alternative II allows for the highest level of resource use and maintains the vegetation of the planning area in non-native perennial grasslands. This community type would be relatively stable and would provide some level of resistance to noxious weed and invasive plant introduction and spread. Higher livestock grazing allocations as well as anticipated increased number and density of livestock facilities would tend to reduce vegetation cover and disrupt soils in facility locations. Alternative II also allows for increased access for recreation, commodity use, and mineral extraction. Impacts associated with density of roads would increase potential for introduction and spread of noxious weeds and invasive plants.

Overall, Alternative II would result in moderate adverse impacts to vegetation communities due to the increased potential for the introduction and spread of noxious weeds and invasive plants.

Impacts from Alternative III

Alternative III ranked sixth for reducing the potential for the introduction and spread of noxious weeds and invasive plants. Management actions under Alternative III would focus primarily on creating conditions to improve wildland fire suppression activities and reduce fire size. While less wildland fire on the landscape would reduce the potential for noxious weed and invasive plant introduction and spread, the actions under Alternative III would result in an increase in short- and long-term impacts resulting primarily from construction, use, and maintenance of roads and wildland fire suppression facilities, creation and maintenance of fire breaks, and use of livestock grazing to reduce fuels. The potential for noxious weed and invasive plant introduction and spread would also be increased due to higher potential for mineral development compared to the other alternatives except Alternative II.

Overall, Alternative III would result in minor adverse impacts to vegetation communities. Despite the reduction in wildland fire size, the increase in soil disturbance associated with wildland fire suppression access and fuels reduction activities would increase the potential for the introduction and spread of noxious weeds and invasive plants.

Impacts from Alternative IV

Alternative IV does the most of all the alternatives to reduce the potential for the introduction and spread of noxious weeds and invasive plants throughout the planning area. Alternative IV contains specific actions that would reduce the amount and extent of disturbance to vegetation, soils, and biological soil crusts. Alternative IV would provide management to reduce the long-term potential for noxious weed and invasive plant introduction and spread through upland vegetation treatments to restore native shrubland

communities, wildland fire management priorities that protect existing and restored native shrubland communities, reductions in livestock grazing allocations and facilities, travel designations, land use authorizations, and mineral development. The potential for the introduction and spread of noxious weeds and invasive plants would be slightly larger in Alternative IV-B than Alternative IV-A due to the decreased acres in Areas of Critical Environmental Concern designations, allowing for more ground-disturbing activities. Therefore, Alternative IV-A was ranked first and Alternative IV-B was ranked second for reducing potential for noxious weed and invasive plant introduction and spread.

Overall, Alternative IV would result in moderate beneficial impacts to vegetation communities due to the focus on protection and restoration of native plant communities and reduction in soil-disturbing activities associated with resource uses.

Impacts from Alternative V

Alternative V ranked third for reducing potential for introduction and spread of noxious weeds and invasive plants. Alternative V would do less to restore native shrubland communities due to a more passive approach to vegetation treatments. While this would reduce short-term impacts to existing vegetation and soils, long-term effects related to restoration of upland vegetation communities would cover a smaller geographic area compared to Alternative IV. Alternative V also contains greater potential for noxious weed and invasive plant introduction and spread associated with potential mineral development.

Overall, Alternative V would result in minor beneficial impacts to vegetation communities due to the passive nature of vegetation treatments.

Impacts from Alternative VI (Proposed RMP)

Alternative VI is fifth for reducing the potential for the introduction and spread of noxious weeds and invasive plants. Management actions under Alternative VI would tend to moderate disturbance to vegetation and soil resources while allowing for multiple uses.

Alternative VI would result in minor beneficial impacts to vegetation communities due to the maintenance of current conditions with some potential for reduction in introduction and spread of noxious weeds and invasive plants over the long term.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Cumulative impacts for noxious weeds and invasive plants consist of incremental effects of the alternatives when added to other past, present, and reasonably foreseeable future actions. These effects can occur over a long period of time, resulting in the gradual changes in potential noxious weed and invasive plant introduction and spread.

Because of similarities in geology, soils, and vegetation, the planning area and the following areas form the geographic boundary for the cumulative impact analysis area for noxious weeds and invasive plants: adjacent portions of BLM's Burley, Bruneau, Shoshone, and Wells (NV) Field Offices and Snake River Birds of Prey National Conservation Area; the South Hills Unit of the Sawtooth National Forest; and the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest. This area includes Federal, State, and private lands. The temporal scope of the analysis is approximately 20 years or the life of the plan.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect noxious weeds and invasive plants:

- Military Use,
- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Transportation and Travel, and
- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Past livestock grazing and wildland fires resulted in vegetation removal and, in some areas, replacement with annual or non-native perennial communities. This conversion has been extensive throughout the cumulative analysis area, particularly in areas where the elevation is less than 5,000 feet. Wildland fires and associated impacts to plant communities are expected to continue within the planning area as well as adjacent Federal, State, and private lands. Under the No Action Alternative, frequency and scale of wildland fire is expected to occur at current or increased levels. High suppression priorities for ignitions on military ranges would shift suppression efforts away from BLM-managed lands within the planning area or adjacent Federal, State, or private lands in the event of multiple incidents. This would result in local or large-scale increases in introduction and spread of noxious weeds and invasive plants. Removal of livestock from burned public lands and shifting use elsewhere would result in potential for increased introduction and spread of noxious weeds and invasive plants on other Federal, State, or private lands.

Because most of the planning area would remain open to cross-country motorized vehicle use, users from surrounding areas with more restrictions (e.g., National Forests and the Snake River Birds of Prey National Conservation Area) would likely utilize the planning area, increasing the potential for introduction and spread of noxious weeds and invasive plants.

Past and future land use authorizations have occurred and would occur on adjacent Federal, State, and private lands. Increased introduction and spread of noxious and invasive plants would occur on affected ownerships, and the effects associated with construction, use, and maintenance of access routes for facilities on adjacent lands would be additive to those described and analyzed for the No Action Alternative. Cumulative effects from land use authorizations would be higher for the No Action Alternative than Alternatives I, III, IV, and V due to fewer restrictions on commercial development.

Cumulative Impacts from Alternative I

Under Alternative I, cumulative impacts related to wildland fire would be due to upland vegetation treatments and wildland fire management actions that would increase vegetation resilience and reduce fire size. This would potentially reduce impacts of wildland fire and associated potential for noxious weed and invasive plant introduction and spread on adjacent Federal, State, and private lands.

Alternative I would increase the acres of areas closed and limited to designated routes within the cumulative analysis area. Restrictions in the planning area may result in increased impacts on adjacent Federal and State lands where cross-country motorized vehicle use is less restricted. Increased impacts to adjacent BLM lands would be short-term since the Bruneau, Burley, and Shoshone Field Offices are scheduled to prepare RMPs for their respective planning areas in the near future. Likewise, the Humboldt-Toiyabe National Forest has initiated their travel management planning process. According to current policy, travel designations would substantially decrease the amount of areas open to cross-country motorized vehicle use.

Cumulative impacts for noxious weed and invasive plant introduction and spread would increase throughout the region due to potential land use authorizations for energy projects. Cumulative impacts to the planning area should be less extensive under Alternative I compared to the No Action Alternative and Alternative II, which incorporate fewer restrictions on commercial development. This would shift impacts to adjacent Federal, State, and private lands.

Cumulative Impacts from Alternative II

Cumulative impacts regarding potential for introduction and spread of noxious weeds and invasive plants under Alternative II are expected to be similar to the No Action Alternative. Alternative II prioritizes the least acres of all action alternatives for critical suppression and creates a landscape dominated by non-native perennial communities. While these plant communities are relatively resilient in the event of wildland fire, wildland fire management priorities would increase potential for wildland fire spread to

adjacent Federal, State, and private lands. This would increase potential in those areas for noxious weed and invasive plant introduction and spread.

Although no areas would be open to cross-country motorized vehicle use, the impacts to soil resources would be larger in scale due to the expected increase in route density associated with commercial operations. As with Alternative I, the lack of cross-country motorized vehicle opportunities would likely shift current use to adjacent Federal or State lands with fewer restrictions.

Cumulative impacts regarding the introduction and spread of noxious weeds and invasive plants through energy development under Alternative II are expected to be similar to those described for the No Action Alternative.

Cumulative Impacts from Alternative III

Under Alternative III, cumulative effects of wildland fire management on the potential for noxious weed and invasive plant introduction and spread are expected to be slightly greater than Alternative I. Increases in wildland fire suppression infrastructure would reduce potential for wildland fire to spread to adjacent Federal, State, and private lands. However, potential for introduction and spread of noxious weeds and invasive plants would be greater. Cumulative impacts related to transportation and travel actions and potential energy development would be similar to Alternative I.

Cumulative Impacts from Alternative IV

Under Alternative IV, cumulative impacts regarding the potential for noxious weed and invasive plant introduction and spread related to wildland fire management are expected to be slightly less than Alternative I. This is due to the larger number of acres prioritized for critical suppression and the reduced potential for wildland fire spread to adjacent Federal, State, and private lands. The cumulative effects of transportation and travel actions and potential energy development would be similar to Alternative I.

Cumulative Impacts from Alternative V

Under Alternative V, cumulative impacts regarding the potential for noxious weed and invasive plant introduction and spread related to wildland fire management would be fewest of all alternatives. Critical suppression priorities would reduce the potential for spread to adjacent Federal, State, and private lands. Alternative V contains the most restrictive travel management allocations of all the alternatives. The lack of cross-country motorized vehicle opportunities would likely shift current use to adjacent Federal or State lands with fewer restrictions. Likewise, Alternative V contains the least acreage identified for utility right-of-way corridors and wind energy development projects. This would shift development from the planning area onto adjacent Federal, State, or private lands.

Cumulative Impacts from Alternative VI (Proposed RMP)

Under Alternative VI, cumulative impacts regarding the potential for noxious weed and invasive plant introduction and spread related to wildland fire management are expected to be slightly less than Alternative I. This is due to upland vegetation treatments that would increase vegetation resilience over greater acreage than Alternative I. This along with wildland fire management would reduce fire size and reduce the potential for fire spread to adjacent Federal, State, and private lands.

Cumulative impacts related to transportation and travel actions and potential energy development would be similar to Alternative I.

4.3.9. Wildland Fire Ecology and Management

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to wildland fire ecology and management:

- **Fire size** – This indicator measures the effectiveness of management actions including suppression actions and vegetation treatments, both inside and outside the wildland urban interface (WUI).

Suppression actions can reduce the size of wildland fires, while vegetation treatments can alter wildland fire behavior characteristics such as rate of spread. Rate of spread directly relates to fire size with higher rate of spread indicating a larger fire size. As fire size increases, so do the costs associated with suppressing the fire.

- **Number of human-caused fires** – This indicator is a measure of the effectiveness of management actions which reduce the number of wildland fires caused by humans. Actions that reduce the number of human-caused fires include restrictions on human activities such as travel, land uses, and preventative action such as education.
- **Fire Regime Condition Class (FRCC)** – BLM policy requires current and desired resource conditions related to wildland fire management to be described in terms of FRCC. This indicator measures the effectiveness of management actions in maintaining or changing the historical fire regime and historical vegetation composition. FRCC is dependent on changes in fire return interval, fire severity, and vegetation. Changes are measured by the degree of departure from a historical reference condition as it pertains to both vegetation successional classes and fire frequency. Any action which alters vegetation successional classes or fire frequency could change the FRCC.

Methods and Assumptions

Impacts to wildland fire ecology and management from management in the following sections were analyzed in detail: *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, and *Land Use Authorizations*. Impacts from management in the *Vegetation Communities* and *Noxious Weeds and Invasive Plants* sections were captured in the analysis of impacts from wildland fire ecology and management sections and to avoid repetition were not discussed separately. Management from the remaining sections was excluded from detailed analysis because the management did not vary measurably between alternatives or impact the indicators for wildland fire ecology and management. Impacts from management for wildland fire can be found under *Impacts from Wildland Fire Ecology and Management Actions* in the *Air Quality*, *Climate Change*, *Soil Resources*, *Water Resources*, *Upland Vegetation*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Plants*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Wild Horses*, *Cultural Resources*, *Livestock Grazing*, *Recreation*, *Transportation and Travel,* and *Wilderness* sections.

Wildland Fire Ecology and Management

Wildland fire management actions related to suppression that affect wildland fire size and the number of human-caused fires were identified to determine the impacts of wildland fire suppression actions. These suppression actions include developing water sources, increasing access such as building or improving roads, implementing prevention activities, and building infrastructure such guard stations. Assumptions used in this component of the analysis include:

- Developing water sources increases wildland fire suppression efficiency and decreases fire size,
- Increasing access decreases response time and decreases fire size,
- Implementing prevention activities decreases number of human-caused fires, and
- Building infrastructure decreases response time and decreases fire size.

The actions were analyzed collectively and since specific locations of the suppression actions are not identified, it is assumed the development of water sources, increasing access, implementing prevention activities, and building infrastructure would be implemented by Vegetation Management Area (VMA) suppression priorities as identified in Chapter 2. To determine the effects of suppression actions for each alternative, the top two priority VMAs and their associated fire information were evaluated.

The following fire information was determined for each VMA using the historical data from 1987 through 2011:

- Percentage of the total fires caused by humans and lightning in the planning area,
- Average number of fires per year,
- Percentage of total fires caused by humans in the planning area,

- Average number of fires in critical suppression areas, and
- Acres of fuels with a rate of spread of moderate or higher within the WUI.

Management actions related to vegetation treatments may result in a change to the fuel model and therefore fire behavior, including rate of spread, which in turn affects fire size. The analyses of vegetation treatments that affect fire size include all vegetation treatments from management actions for *Upland Vegetation*, *Noxious Weeds and Invasive Plants*, and *Wildland Fire Ecology and Management*. A fuel model was determined using Standard Fire Behavior Models (Scott and Burgan, 2005) and assigned to the existing vegetation and the expected change to vegetation from treatments. The changes in the rate of spread from changes to the vegetation based on the fuel model were analyzed for each alternative and then compared. Impact to fire size and rate of spread in the WUI was based on acres of treatments within the WUI. Assumptions used in this component of the analysis include:

- All vegetation treatments within the WUI would reduce fire size regardless of changes to FRCC ratings, and
- Vegetation treatments within the WUI would be focused on reducing fire size by modifying fuels and rates of spread.

Management actions related to vegetation treatments may result in a change to vegetation which would affect FRCC. Change to this condition class from fuels treatments was calculated by VMA for each alternative based on all vegetation treatments from management actions for *Vegetation Communities*, *Noxious Weeds and Invasive Plants*, and *Wildland Fire Ecology and Management*. FRCC was determined using the process identified in the Interagency and The Nature Conservancy Fire Regime Condition Class website (Hann, 2008; www.frames.gov; www.frcc.gov) and the Interagency Fire Regime Condition Class Guidebook (Hann, 2004).

The acres of the historical vegetation composition which should exist on the planning area were determined and assigned to a vegetation model known as a potential natural vegetation group (PNVG) (LANDFIRE, 2007) for example Wyoming Sagebrush Steppe (see *Upland Vegetation)*. Each vegetation model recognizes the historical vegetation is composed of a mix of native vegetation in differing stages of development (early, mid, late). Each stage is referred to as the successional class (S-Class). In the Wyoming Sagebrush Steppe, early-successional vegetation is primarily composed of native grasses while late-successional vegetation is dominated by native shrubs. The closeness to which each successional class in the current or expected vegetation matches the model is referred to as S-Class similarity. Vegetation which is not part of the historical vegetation compost ion such as cheat grass is considered “uncharacteristic”. When the S-Class similarity of the vegetation matches a certain range of the historical vegetation or model it is considered to be FRCC 1. For example, the Wyoming Sagebrush Steppe would be composed of 20% early-successional (grass), 50% mid-successional (mix of grass and shrub), and 30% late-successional classes (shrub dominated) with no uncharacteristic vegetation. As the S-Class similarity or the mix of grass, shrub, and uncharacteristic vegetation changes or differs and becomes unlike the historical vegetation, the condition class becomes FRCC 2 or FRCC 3 depending on the amount of change or difference.

Depending on the alternative only certain PNVGs were identified for treatments (see *Upland Vegetation and Noxious Weeds and Invasive Plants*) and include Basin Big Sagebrush, Black and Low Sagebrush, Mountain Big Sagebrush, and Wyoming Sagebrush Steppe.

Assumptions used in this component of the analysis include:

- Most PNVGs within the planning area have burned more frequently than the historic fire return interval.
- Management actions that move the vegetation composition to the historical composition (i.e., move an area toward FRCC 1) would lengthen the mean fire return interval.
- All vegetation treatments would be successful as identified in the *Upland Vegetation* section.
- Impacts to FRCC could be from any management action that pertains to vegetation treatments including actions for fuels and emergency stabilization and burned area rehabilitation.

Livestock Grazing

Management actions for livestock grazing were identified and evaluated for their effect on wildland fire ecology and management. The fire history, fuel distribution, and livestock grazing actions that would affect animal unit months (AUMs) and utilization levels were examined. Estimated utilization levels of non-native vegetation were compared between the alternatives since areas with these vegetation types are prone to frequent fires and large fires. It was assumed higher utilization levels in non-native vegetation would have an immediate effect in decreasing fire size (Call et al., 2007; Launchbaugh et al., 2008; Strand et al., 2007), especially in areas dominated by cheatgrass. AUMs were used to compare the No Action Alternative with the action alternatives since no levels of utilization are identified in the current management plan. While the number of AUMs could not be attributed to a specific vegetation type or area in the current plan, it was assumed that a higher amount of allowable AUMs would have more of an effect in decreasing fire size.

Changes to species diversity, structural complexity, and introduction of invasive plants and weeds affect the mix of grasses, shrub, and uncharacteristic vegetation within the historic vegetation composition. Since these changes are analyzed in the upland vegetation and noxious weed sections, the impacts are carried from those sections to determine the relative change to FRCC in this section. For example if the upland vegetation and noxious weed sections showed no change to diversity, complexity, or introduction of invasives then there would be no change to the FRCC. Assumptions used in this component of the analysis include:

- An increase in species diversity and structural complexity increases the historical vegetation composition and improves FRCC rating, and
- An increase in noxious weeds and invasive plants decreases the historical vegetation composition and reduces FRCC rating.

Recreation

Management actions for recreation were identified and evaluated for their effect on wildland fire ecology and management. Each Special Recreation Management Area (SRMA) was evaluated as to type, size, location, and expected change in the amount of use. Some of the SRMAs that would be designated in each alternative are not expected to affect the number of human-caused fires. The larger SRMAs, Canyonlands and Jarbidge Foothills, promote activities associated with campfires, which are the leading human cause of wildland fires. However, these areas are not expected to see an increase in use whether they are designated as SRMAs or not; and therefore the number of human-caused fires is also not expected to increase. Similarly, recreational use in the Bruneau-Jarbidge and Jarbidge Forks SRMAs is not expected to increase; therefore, the number of human-caused fires is not expected to increase. The areas within the Balanced Rock, Little Pilgrim, and Salmon Falls Reservoir SRMAs are expected to see an increase in use and an increase in infrastructure to manage that use if they are designated. However, infrastructure such as fire rings would decrease the number of human-caused fires, while improved road systems and parking areas would decrease fuels and create barriers to fire starts and growth. As a result, this section of the analysis focuses on the areas each alternative would proactively manage for motorized recreational use, primarily off-highway vehicle use. Assumptions used in this component of the analysis include:

- SRMAs managed for mechanized recreation use would be more susceptible to human-caused fires more than SRMAs managed for other recreational uses,
- An increase in the size of the SRMA would proportionally increase the amount of off-highway vehicles and people which would make the area more susceptible to fire starts, and
- Temporal extent and magnitude of impacts are not specific but would be realized over twenty years and would be proportional to size of the SMRA.

Transportation and Travel

Management actions for transportation and travel were identified and evaluated for their effect on wildland fire ecology and management. To determine the effect of these actions, the number of acres of each travel designation (i.e., open to cross-country motorized vehicle use, limited to designated routes, or

closed to motorized vehicle use) was calculated by VMA for each alternative. Assumptions used in this component of the analysis include:

- Areas identified as open to cross-country motorized vehicle use would be more susceptible to human-caused fires,
- Areas identified as closed to motorized vehicle use would be less susceptible to human-caused fires, and
- Temporal extent and magnitude of impacts are not specific but would be realized over twenty years and would be proportional to size of the closed or open area.

Land Use Authorizations

Management actions for land use authorizations were identified and evaluated for their effect on wildland fire ecology and management. Actions that would increase or decrease the number of acres available for expected wind energy development and exclusion areas were identified as actions that would affect fire starts. The difference in acres between the amount of exclusion and expected wind energy in the alternatives was compared and evaluated. Other uses including mineral development, oil and gas, geothermal, and solar were not expected to change and associated acreages did not vary between alternatives. Assumptions used in this component of the analysis include:

- Increases in the number of acres available for development would be more susceptible to human-caused fires,
- Increases in the number of acres excluded for development would be less susceptible to human-caused fires, and
- Temporal extent and magnitude of impacts are not specific but would be realized over twenty years and would be proportional to size of the available or excluded area.

Direct and Indirect Impacts

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire and Ecology Management actions on wildland fire and ecology management:

- Fire size,
- Number of human-caused fires, and
- Fire Regime Condition Class (FRCC).

Vegetation community management directly impacts wildland fire ecology and management (Brown and Smith, 2000). This management affects the direction of emergency stabilization and burned area rehabilitation and fuels treatments and influences fire behavior, fire regime, fire return interval, and FRCC. Many noxious weeds and invasive plants are fine fuels that carry fire across the landscape, burn rapidly, and are difficult to suppress. Many noxious weeds and invasive plants, because of their flammability, may shorten the fire return interval in the planning area as compared to the historic fire regime. This is true for cheatgrass (Young and Blank, 1995).

Impacts from actions from the *Upland Vegetation* section of *Vegetation Communities* and *Noxious Weeds and Invasive Plants* sections of Chapter 2 are analyzed in this section in order to avoid repetition. The indicators used in this section are fire size, number of human-caused fires, and FRCC.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, fires would be managed for full suppression in order to reduce fire size. Indirect attack would be preferred over surface disturbance. Indirect attack such as burning a control line away and in front of the fire advance implies an acceptance of a larger fire. There would be no emphasis on changing FRCC, reducing the number of human-caused fires, and reducing impacts to the wildland urban interface (WUI). Based on the fire history from 1987 to 2011, the planning area averages 21 fires per year, of which an average of 12 fires are caused by human actions. There are 77,000 acres of hazardous fuels or fuels with high rates of spread in the WUI which would not decrease due to the lack of

emphasis on reducing hazardous fuels in the WUI. It is difficult to determine a trend for increases or decreases in the number of fires from the fire history data.

While full suppression is one of the management actions, the number of acres burned is increasing per fire. The benchmark for the most BLM acres burned per year is also increasing both temporally and spatially: 64,000 acres in 1987, 136,000 in 1995, 201,000 in 2005, 438,000 in 2007, and 305,000 in 2010. This alternative would reduce fire size the least of all alternatives, as shown by the trend in fire history and the lack of actions addressing changes towards more historical vegetation. With no emphasis on prevention, mitigation, or other actions to reduce fire starts, fire numbers would increase or, at minimum, stay at the current trend. Vegetation would be dominated by grasses and non-native perennials resulting in a homogenous landscape which would maintain the current trend of frequent large fires. Therefore FRCC would also remain or trend towards FRCC 3 under current vegetation management direction.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives would decrease fire size and the number of human-caused fires.

Impacts from Management Specific to Alternative I

Under Alternative I, fire suppression management actions focus on Vegetation Management Areas (VMAs) C and B which is the same as Alternatives V and VI. The historical data show 59% of the fire starts, or 12 fires, occurred in VMAs C and B yearly. An average of 5 of the 12 fires occurred in the critical suppression areas which are composed of high hazard WUI, specific areas of critical environmental concern, and key sage-grouse habitat. Historically within these VMAs, on average five fires were caused by humans yearly. Forty-five percent, or 35,000 acres, of all the WUI with hazardous fuels occur within VMAs C and B, with the majority being in VMA B.

The suppression actions in Alternative I would incrementally affect 59% of fires in the planning area over the next twenty years. However once actions are implemented the effect would be realized within one to five years. This would result in the second highest reduction in the number of human-caused fires (same as Alternatives V and VI) and fire size from suppression actions.

Vegetation treatments that change the current plant community could also change the fuel model and fire behavior, including rate of spread. Each plant community is associated with a class of fire behavior. Table 4-195 shows the change in plant community as measured by change in fire behavior class using rate of spread for each VMA. For example “No Change” for a fire with a “Very Low” rate of spread indicates there was neither an increase nor decrease, due to treatments, in the acres of vegetation associated with the “Very Low” class for rate of spread.

Table 4-195. Change in Rate of Spread of Fire for Alternative I

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Very Low (0-2 Ch/Hr [A])	No Change	No Change	No Change	No Change
Low (2-5 Ch/Hr)	No Change	No Change	No Change	No Change
Moderate (5-20 Ch/Hr)	No Change	No Change	No Change	1% Decrease
High (20-50 Ch/Hr)	12% Increase	3% Increase	No Change	1% Increase
Very High (50-150 Ch/Hr)	12% Decrease	3% Decrease	No Change	< 1% Decrease

[A] Ch/Hr = Chains per hour; 1 chain = 66 feet.

VMA A would have the most change with 12% of the VMA experiencing a reduction in rate of spread from Very High to High followed by VMA B. VMA A and VMA B account for 27% and 45% of the fires, respectively. When all changes are calculated for the planning area, this alternative reduces the rate of spread on 3% of the planning area within twenty years but treatments would be effective within one to two years of implementation and would last five to ten years without maintenance. Fuels treatments would reduce fire size more than the No Action Alternative and Alternative V but less than Alternatives II, III, IV, and VI.

This would decrease rate of spread on 4,000 acres in the northern portion of the planning area. This reduction would occur over the next twenty years as treatments are implemented but treatment effect would be realized within one to two years of implementation and last 5 to 10 years without maintenance. This would be the same as Alternative IV (4,000 acres), more than Alternative V (3,000 acres) and the No Action Alternative (no acres), but less than Alternative II (5,000 acres), Alternative III (6,000 acres) and Alternative VI (6,000 acres).

Table 4-196 shows the potential natural vegetation groups (PNVG) for each VMA which would receive vegetation treatments and the amount of change to the vegetation composition as measured by successional class (S-Class) similarity and the resulting FRCC rating. Only PNVGs that were identified for treatments were analyzed and reflected in the table.

Vegetation treatments implemented for this alternative improves the mix of native grass and shrubs (vegetation composition) as measured by S-Class Similarity in all vegetation groups (PNVG) across all VMAs except Mountain Big Sagebrush in VMA D. Mountain Big Sagebrush in the VMA still retains the vegetation composition to be FRCC 1. The improvement in the historic vegetation composition in the rest of the vegetation groups is enough to improve the condition to lengthen the current interval between large fires except for VMA A and Wyoming Sagebrush Steppe in VMA D

Table 4-196. Change in Successional Class Similarity and Overall Fire Regime Condition Class for Alternative I

VMA	PNVG	S-Class Similarity	Overall FRCC
A	Wyoming Sagebrush Steppe	Increases from 18% to 30%	Remains at FRCC 3
B	Wyoming Sagebrush Steppe	Increases from 40% to 67%	Improves from FRCC 2 to FRCC 1
C	Wyoming Sagebrush Steppe	Increases from 46% to 82%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 75%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 33% to 56%	Improves from FRCC 3 to FRCC 2
D	Wyoming Sagebrush Steppe	Increases from 53% to 58%	Remains at FRCC 2
	Basin Big Sagebrush	Increases from 16% to 86%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 37% to 89%	Improves from FRCC 2 to FRCC 1
	Mountain Big Sagebrush	Decreases from 68% to 67%	Remains at FRCC 1

When all the changes in vegetation are calculated and added to vegetation that currently meets S-Class similarity, a total of 861,000 acres would be in FRCC 1 at the end of twenty years. This alternative would improve FRCC more than the No Action Alternative (498,000 acres) and Alternatives II (498,000 acres), III (684,000 acres), and V (731,000 acres), but less than Alternatives IV (910,000 acres) and VI (862,000 acres).

Impacts from Management Specific to Alternative II

Under Alternative II, the fire suppression management actions focus on VMA A and VMA B. The historical data show 72% of the fire starts, or 15 fires, occurred yearly in these VMAs. On average, six of those fires occurred in critical suppression areas, which would only include the WUI. On average, 6 of the 15 fires were caused by humans. Over 82% of all the WUI with hazardous fuels occur within VMAs A and B.

Suppression actions in Alternative II would incrementally affect 72% of the fires in the planning area over the next twenty years. However once actions are implemented the effect would be realized in one to five

years. This would result in the highest reduction in the number of human-caused fires and fire size, same as Alternative III.

Vegetation treatments that change the current plant community could also change the fuel model and rate of spread. VMA A would have the most change with 23% of the VMA having a reduction in rate of spread followed by VMA B with a 5% reduction. VMA A and VMA B account for 27% and 45% of the fires, respectively. Vegetation treatments implemented for this alternative reduce the rate of spread on 6% of the planning area within 20 years but would be effective within one to two years of implementation and would last five to ten years without maintenance. This alternative is similar to Alternative IV but has slightly less reduction in rates of spread in VMA D. The vegetation treatments in this alternative would be second best at reducing the fire size due to amount of decrease in the rate of spread in high fire VMAs.

Table 4-197. Change in Rate of Spread of Fire for Alternative II

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Very Low (0-2 Ch/Hr [A])	No Change	No Change	No Change	No Change
Low (2-5 Ch/Hr)	No Change	No Change	No Change	No Change
Moderate (5-20 Ch/Hr)	No Change	No Change	No Change	< 1% Increase
High (20-50 Ch/Hr)	23% Increase	5% Increase	No Change	< 1% Increase
Very High (50-150 Ch/Hr)	23% Decrease	5% Decrease	No Change	< 1% Decrease

[A] Ch/Hr = Chains per hour; 1 chain = 66 feet.

Vegetation treatments within the WUI would reduce rate of spread on 5,000 acres in the northern portion of the planning area and the Roseworth area. This reduction would occur over the next twenty years as treatments are implemented but treatment effect would be realized within one to two years of implementation and would last 5 to 10 years without maintenance. The decrease to fire size in the WUI would be more than in the No Action Alternative and Alternatives I (4,000 acres), IV (4,000 acres), and V (3,000 acres), but less than Alternatives III (6,000 acres) and VI (6,000 acres).

Vegetation treatments implemented for this alternative would not improve historical vegetation composition in any vegetation groups across any VMA so would not lengthen the interval between large fires. The overall FRCC rating would remain the same as the baseline FRCC rating.

Table 4-198. Change in Successional Class Similarity and Overall Fire Regime Condition Class for Alternative II

VMA	PNVG	S-Class Similarity	Overall FRCC
A	Wyoming Sagebrush Steppe	Remains at 18%	Remains at FRCC 3
B	Wyoming Sagebrush Steppe	Remains at 40%	Remains at FRCC 2
C	Wyoming Sagebrush Steppe	Remains at 46%	Remains at FRCC 2
	Basin Big Sagebrush	Remains at 16%	Remains at FRCC 3
	Black and Low Sagebrush	Remains at 33%	Remains at FRCC 3
D	Wyoming Sagebrush Steppe	Remains at 53%	Remains at FRCC 2
	Basin Big Sagebrush	Remains at 16%	Remains at FRCC 3
	Black and Low Sagebrush	Remains at 37%	Remains at FRCC 2
	Mountain Big Sagebrush	Remains at 68%	Remains at FRCC 1

Currently, 498,000 acres meet S-Class similarity across all VMAs throughout the planning area. There would be no increase in acres that are similar when compared to the baseline vegetation and projected vegetation. This alternative would not improve FRCC, which would be the same as the No Action Alternative.

Impacts from Management Specific to Alternative III

Suppression actions and emphasis in Alternative III would be the same as Alternative II, with the exception of the WUI, areas of critical environmental concern and key sage-grouse habitat having the highest suppression priority. Suppression actions and emphasis are primarily concentrated in VMAs with

a high amount of fire potential; therefore, as in Alternative II, suppression actions would result in the highest reduction in the number of human-caused fires and fire size.

Vegetation treatments that change the current plant community could also change the fuel model and rate of spread. VMA A would have the most change with 19% of the VMA having a reduction in rate of spread. The increase in the Very Low rate of spread is due to unvegetated fuel breaks which are allowed in this alternative. VMA B would have a 5% decrease in Very High. VMA A and VMA B account for 27% and 45% of the fires, respectively.

Vegetation treatments implemented in Alternative III reduce the rate of spread from Very High on 5% of the planning area while increasing 1% of the Very Low. In VMA D there would be a less than 1% decrease in Very High to a lower rate and a less than 1% decrease in Low to a higher rate. However, VMA D experiences lower fire occurrence and less large fire than the other VMAs and the changes may counter each other. Changes to rate of spread in the entire planning area would be fully realized after twenty years but effects would be realized in one to two years of implementation and would last five to ten years without maintenance. This alternative would reduce fire size better than the No Action Alternative, and Alternatives I, V, and VI but less than Alternatives II and IV. This is due to Alternatives II and IV having greater reductions in rate of spread in high fire VMAs.

Table 4-199. Change in Rate of Spread of Fire for Alternative III

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Very Low (0-2 Ch/Hr [A])	2% Increase	2% Increase	1% Increase	< 1% Increase
Low (2-5 Ch/Hr)	No Change	< 1% Decrease	< 1% Decrease	1% Decrease
Moderate (5-20 Ch/Hr)	No Change	No Change	No Change	< 1% Increase
High (20-50 Ch/Hr)	17% Increase	3% Increase	1% Decrease	1% Increase
Very High (50-150 Ch/Hr)	19% Decrease	5% Decrease	No Change	< 1% Decrease

[A] Ch/Hr = Chains per hour; 1 chain = 66 feet.

Vegetation treatments within the WUI would reduce rate of spread on 6,000 acres in the northern portion of the planning area, the Roseworth area, and the Three Creek area, the same as Alternative VI. This reduction would occur over the next twenty years as treatments are implemented but treatment effect would be realized within one to two years of implementation and would last five to ten years without maintenance. Alternative III and Alternative VI would reduce fire size in the WUI more than other alternatives.

Vegetation treatments implemented for this alternative improves vegetation composition in all vegetation groups across all VMAs. However, only the vegetation groups in VMA C and Basin Big Sagebrush in VMA D experience enough change to lengthen the interval between large fires and improve FRCC.

Table 4-200. Change in Successional Class Similarity and Overall Fire Regime Condition Class for Alternative III

VMA	PNVG	S-Class Similarity	Overall FRCC
A	Wyoming Sagebrush Steppe	Increases from 18% to 19%	Remains at FRCC 3
B	Wyoming Sagebrush Steppe	Increases from 40% to 54%	Remains at FRCC 2
C	Wyoming Sagebrush Steppe	Increases from 46% to 70%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 88%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 33% to 57%	Improves from FRCC 3 to FRCC 2

VMA	PNVG	S-Class Similarity	Overall FRCC
D	Wyoming Sagebrush Steppe	Increases from 53% to 61%	Remains at FRCC 2
	Basin Big Sagebrush	Increases from 16% to 45%	Improves from FRCC 3 to FRCC 2
	Black and Low Sagebrush	Increases from 37% to 52%	Remains at FRCC 2
	Mountain Big Sagebrush	Increases from 68% to 71%	Remains at FRCC 1

When all the changes in vegetation are calculated and added to vegetation which currently meets S-Class similarity, a total of 684,000 acres would be in FRCC 1 after twenty years. Alternative III would improve FRCC more than the No Action Alternative (498,000 acres) and Alternative II (498,000 acres), but less than Alternatives I (861,000 acres), IV (910,000 acres), V (731,000 acres), and VI (862,000 acres).

Impacts from Management Specific to Alternative IV

Under Alternative IV, fire management suppression actions focus on VMAs C and D. The historical data show 28% of the fire starts, or six fires, occurred yearly in these VMAs. On average, one of those fires occurred in the critical suppression areas, which would include the WUI, areas of critical environmental concern, and key sage-grouse habitat. On average, two of the six fires were caused by humans. Just 18% of all the WUI with hazardous fuels occur within VMA C and VMA D.

Suppression actions would incrementally affect 28% of fires in the planning area over the next twenty years. However, once actions are implemented the effect would be realized within one to five years. This would result in the lowest reduction in the number of human-caused fires and fire size.

Vegetation treatments implemented for this alternative reduce the rate of spread on 6% of the planning area after twenty years. VMA A would have the most change with 23% of the VMA experiencing a reduction in rate in spread followed by VMA B with 5%. VMA A and VMA B account for 27% and 45% of the fires, respectively. As treatments are implemented this reduction in rate of spread and fire size would occur within one to two years after implementation and would last five to ten years without maintenance. This alternative is similar in results to Alternative II but has additional reductions in rates of spread in VMA D. Alternative IV would be best at reducing fire size due to highest amount of reduction in rate of spread.

Table 4-201. Change in Rate of Spread of Fire for Alternative IV

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Very Low (0-2 Ch/Hr [A])	No Change	No Change	No Change	No Change
Low (2-5 Ch/Hr)	No Change	No Change	No Change	No Change
Moderate (5-20 Ch/Hr)	No Change	No Change	No Change	1% Increase
High (20-50 Ch/Hr)	23% Increase	5% Increase	No Change	< 1% Decrease
Very High (50-150 Ch/Hr)	23% Decrease	5% Decrease	No Change	< 1% Decrease

[A] Ch/Hr = Chains per hour; 1 chain = 66 feet.

Vegetation treatments within the WUI would reduce rate of spread on 4,000 acres in the northern portion of the planning area. This reduction would occur over the next twenty years as treatments are implemented but treatment effect would be realized within one to two years of implementation and would last 5 to 10 years without maintenance. Decrease in fire size in the WUI would be the same as Alternative I, more than the No Action Alternative and Alternative V (3,000 acres), but less than Alternatives II (5,000 acres), III (6,000 acres), and VI (6,000 acres).

Vegetation treatments implemented for Alternative IV improve vegetation composition and lengthen the interval between large fires in all vegetation groups across all VMAs. The overall FRCC rating would improve or remain FRCC 1 for all vegetation groups except for Wyoming Sagebrush Steppe in VMA A which would improve to FRCC 2.

Table 4-202. Change in Successional Class Similarity and Overall Fire Regime Condition Class for Alternative IV

VMA	PNVG	S-Class Similarity	Overall FRCC
A	Wyoming Sagebrush Steppe	Increases from 18% to 45%	Improves from FRCC 3 to FRCC 2
B	Wyoming Sagebrush Steppe	Increases from 40% to 74%	Improves from FRCC 2 to FRCC 1
C	Wyoming Sagebrush Steppe	Increases from 46% to 74%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 89%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 33% to 68%	Improves from FRCC 3 to FRCC 1
D	Wyoming Sagebrush Steppe	Increases from 53% to 85%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 76%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 37% to 75%	Improves from FRCC 2 to FRCC 1
	Mountain Big Sagebrush	Increases from 68% to 77%	Remains at FRCC 1

When all the changes in vegetation are calculated and added to vegetation which currently meets S-Class similarity, a total of 910,000 acres would be in FRCC 1 after twenty years. Alternative IV would improve FRCC more than other alternatives.

Impacts from Management Specific to Alternative V

Under Alternative V, fire management suppression actions focus on VMAs C and B, the same as in Alternatives I and VI. Suppression actions and emphasis in Alternative V are primarily concentrated in a VMA with a high amount of fire potential and a VMA with a lower potential; therefore, suppression actions would result in the second highest reduction in the number of human-caused fires and fire size outside and within the WUI, the same as Alternatives I and VI.

Vegetation treatments that change the current plant community could also change the fuel model and rate of spread. Vegetation treatments implemented for this alternative reduce the rate of spread on 3% of the planning area after twenty years but effects would be realized with one to two years after implementation and would last five to ten years without maintenance. VMA A would have the most change with 9% of the VMA having a reduction in rate in spread followed by VMA B with a 3% decrease. VMA A and VMA B account for 27% and 45% of the fires, respectively. This alternative would reduce the rate of spread of fires across the planning area, and hence fire size, more than the No Action Alternative, but less than Alternatives I, II, III, IV, and VI.

Table 4-203. Change in Rate of Spread of Fire for Alternative V

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Very Low (0-2 Ch/Hr [A])	No Change	No Change	No Change	No Change
Low (2-5 Ch/Hr)	No Change	No Change	No Change	No Change
Moderate (5-20 Ch/Hr)	No Change	No Change	No Change	1% Increase
High (20-50 Ch/Hr)	9% Increase	3% Increase	No Change	< 1% Decrease
Very High (50-150 Ch/Hr)	9% Decrease	3% Decrease	No Change	< 1% Decrease

[A] Ch/Hr = Chains per hour; 1 chain = 66 feet.

Vegetation treatments within the WUI would reduce rates of spread on 3,000 acres in the northern portion of the planning area. This reduction would occur over the next twenty years as treatments are implemented but treatment effect would be realized within one to two years of implementation and would

last 5 to 10 years without maintenance. This decrease in fire size in the WUI would be less than all action alternatives and more than the No Action Alternative.

Vegetation treatments implemented for this alternative improve vegetation composition in all vegetation groups across all VMAs. However there is not enough improvement in vegetation composition in VMA A, VMA B, and Mountain Big Sagebrush in VMA D to lengthen the interval between large fires and improve FRCC rating.

Table 4-204. Change in Successional Class Similarity and Overall Fire Regime Condition Class for Alternative V

VMA	PNVG	S-Class Similarity	Overall FRCC
A	Wyoming Sagebrush Steppe	Increases from 18% to 28%	Remains at FRCC 3
B	Wyoming Sagebrush Steppe	Increases from 40% to 55%	Remains at FRCC 2
C	Wyoming Sagebrush Steppe	Increases from 46% to 69%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 75%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 33% to 56%	Improves from FRCC 3 to FRCC 2
D	Wyoming Sagebrush Steppe	Increases from 53% to 73%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 80%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 37% to 68%	Improves from FRCC 2 to FRCC 1
	Mountain Big Sagebrush	Increases from 68% to 72%	Remains at FRCC 1

When all the changes in vegetation are calculated and added to vegetation which currently meets S-Class similarity, the total would be 731,000 acres across the entire planning area. Alternative V would improve FRCC more than the No Action Alternative (498,000 acres) and Alternatives II (498,000 acres) and III (684,000 acres), but less than Alternatives I (861,000 acres), IV (910,000 acres), and VI (862,000 acres).

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, fire suppression management actions focus on VMAs C and B the same as alternative I. Because the suppression actions in Alternative VI are primarily concentrated in VMA B with a high amount of fire potential and VMA C with a lower potential, this alternative, and Alternatives I and V, would result in the second highest reduction in the number of human-caused fires and fire.

Vegetation treatments that change the current plant community could also change the fuel model and rate of spread. Vegetation treatments implemented for this alternative reduce the rate of spread on 4% of the planning area. VMA A would have the most change with 12% of the VMA having a reduction in rate in spread followed by VMA B with 5%. VMA A and VMA B account for 27% and 45% of the fires, respectively. There is an increase in moderate rate of spread from higher rates of spread in VMA D. However, VMA D has a lower fire occurrence and less large fire. This alternative would reduce fire size across the planning area more than the No Action Alternative and Alternatives I and V, but less than Alternatives II, III, and IV.

Table 4-205. Change in Rate of Spread of Fire for Alternative VI (Proposed RMP)

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Very Low (0-2 Ch/Hr [A])	No Change	No Change	No Change	No Change
Low (2-5 Ch/Hr)	No Change	No Change	No Change	No Change

Rate of Spread	VMA A	VMA B	VMA C	VMA D
Moderate (5-20 Ch/Hr)	No Change	No Change	No Change	1% Increase
High (20-50 Ch/Hr)	12% Increase	5% Increase	No Change	< 1% Decrease
Very High (50-150 Ch/Hr)	12% Decrease	5% Decrease	No Change	< 1% Decrease

[A] Ch/Hr = Chains per hour; 1 chain = 66 feet.

Vegetation treatments within the WUI would reduce rate of spread on 6,000 acres in the northern portion of the planning area, the Roseworth area, and the Three Creek area, the same as Alternative III. Alternatives VI and III would decrease fire size in the WUI more than other alternatives.

Vegetation treatments implemented for this alternative improve vegetation composition in all vegetation groups across all VMAs. However there is not enough improvement in vegetation composition in VMA A to lengthen the interval between large fires and improve FRCC rating.

Table 4-206. Change in Successional Class Similarity and Overall Fire Regime Condition Class for Alternative VI (Proposed RMP)

VMA	PNVG	S-Class Similarity	Overall FRCC
A	Wyoming Sagebrush Steppe	Increases from 18% to 29%	Remains at FRCC 3
B	Wyoming Sagebrush Steppe	Increases from 40% to 74%	Improves from FRCC 2 to FRCC 1
C	Wyoming Sagebrush Steppe	Increases from 46% to 74%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 79%	Improves from FRCC 3 to FRCC 1
	Black and Low Sagebrush	Increases from 33% to 68%	Improves from FRCC 3 to FRCC 1
D	Wyoming Sagebrush Steppe	Increases from 53% to 77%	Improves from FRCC 2 to FRCC 1
	Basin Big Sagebrush	Increases from 16% to 66%	Improves from FRCC 3 to FRCC 2
	Black and Low Sagebrush	Increases from 37% to 67%	Improves from FRCC 2 to FRCC 1
	Mountain Big Sagebrush	Increases from 68% to 77%	Remains at FRCC 1

When all the changes in vegetation are calculated and added to vegetation which currently meets S-Class similarity, the total would be 862,000 acres across the entire planning area. Alternative VI would improve FRCC more than all alternatives except for Alternative IV (910,000 acres).

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on wildland fire and ecology management:

- Fire size and
- Fire Regime Condition Class (FRCC).

Fine fuels include annual and perennial grasses and many forbs; these fuels can carry fire rapidly across the landscape. An examination of fire history and fuels distribution in the planning area shows a higher fire occurrence and a larger number of large fires in areas dominated by cheatgrass; these areas also have had a tendency to burn repeatedly. Livestock grazing may reduce fine fuels (Nader et al., 2007). Table 4-207 displays the animal unit months (AUMs) and utilization levels by alternative, which reflect the degree to which fine fuels would be reduced in the planning area. Targeted grazing to reduce fine fuels in strategically located areas can decrease fire size as well (Call et. al., 2007; Launchbaugh et al., 2008; Stran et al., 2007).

Grazing can also alter the species diversity and structural complexity of vegetation as well as the introduction of noxious weeds and invasive plants. These changes can change the historical vegetation composition and therefore affect FRCC rating.

Table 4-207. Livestock Grazing Animal Unit Months and Utilization by Alternative

Grazing AUMs and Utilization	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
AUMs for Livestock at Final Implementation	260,000	245,000	440,000	348,000	123,000	127,000	85,000	279,000
Utilization of Non-Native Vegetation (%)[A]	NA	40-50%	50-60%	50-60%	30-40%	30-40%	30-40%	40-50%

[A] Percent utilization was not identified in the No Action Alternative.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, up to 260,000 AUMs could be authorized at full implementation. The number of AUMs in the No Action Alternative falls in the middle among the alternatives, but percent utilization is not identified in this alternative. A higher proportion of AUMs would be allocated to livestock in the northern two-thirds of the planning area where forage production is higher. This also coincides with areas that have a higher occurrence of large fires and areas that have burned repeatedly. Under the No Action Alternative, grazing would continue to have an effect of slowing the growth of fires, but would promote the dominance of non-native perennial and short stature, early- and mid-successional grasses with a slight increase in noxious weeds and invasive plants which would decrease the amount of historical vegetation. This alternative would decrease fire size more than Alternatives IV and V but less than Alternatives I, IV, V, and VI. This alternative would improve FRCC more than Alternatives II and III but less than Alternatives I, IV, V, and VI.

Impacts from Management Specific to Alternative I

Alternative I would result in slightly less AUMs for livestock than the No Action Alternative. However, along with Alternative VI, the percent utilization in non-native vegetation would cause a moderate reduction in fuel loading. Targeted grazing would also be allowed in this alternative, which would help decrease fire size by reducing fuels in localized areas. Because of the percent utilization of non-native vegetation and forage allocation levels, this alternative would reduce the trend towards increased fire size more than Alternatives IV and V. Structural complexity in perennial herbaceous plants would be reduced with the promotion of early- and mid-successional grasses. This alternative would improve FRCC more than the No Action Alternative and Alternatives II and III but less than Alternatives IV, V, and VI.

Impacts from Management Specific to Alternative II

In Alternative II, areas that are predominantly cheatgrass would have more AUMs and the highest percent utilization of non-native vegetation of any alternative. The percent utilization in non-native vegetation would result in a moderate to high reduction in fuel loading and would reduce fire size the most compared to the other alternatives. Targeted grazing to reduce fire size would be allowed which would reduce fire size in localized areas. These actions result in the highest amount of fine fuel reduction in the areas dominated by cheatgrass which are prone to large fire. Due to the level of utilization, Alternative II would increase non-native perennial and short stature early- and mid-successional grasses while increasing weeds and annual grasses which would decrease the amount of historical vegetation composition. This alternative would improve FRCC the least of all alternatives.

Impacts from Management Specific to Alternative III

Alternative III would have more AUMs for livestock and higher percent utilization of non-native vegetation, than the No Action Alternative, especially in areas that are dominated by cheatgrass, but AUMs would not be to the degree of Alternative II. The percent utilization in non-native vegetation would be the same as Alternative II and lead to a moderate to high reduction in fuel loading. Targeted grazing to reduce fire size would be allowed. This alternative would have the second highest reduction in fire size due to amount of

livestock grazing. Vegetation condition in native communities would remain static but non-native communities would degrade and be susceptible to an increase of weeds and annual grass. Structural complexity in perennial herbaceous plants would be reduced. This alternative would improve FRCC more than Alternative II but less than the other alternatives.

Impacts from Management Specific to Alternative IV

Alternative IV would decrease AUMs for livestock and percent utilization of non-native vegetation compared to the No Action Alternative, especially in areas that are dominated by cheatgrass, but not to the extent of Alternative V. Along with Alternative V, the level of utilization in non-native vegetation for Alternative IV would reduce fuel loading less than in the other alternatives. Targeted grazing to reduce fire size would be allowed in this alternative. This alternative would reduce fire size more than Alternative V, but less than the rest of the alternatives. The amount of livestock grazing would improve vegetation communities and reduce the spread of weeds and annual grass resulting in greater structural integrity which would maintain acres of historical vegetation and move non-historical vegetation to a historical composition. This alternative would improve FRCC more than the No Action Alternative and Alternatives I, II, III, and VI but less than Alternative V.

Impacts from Management Specific to Alternative V

Alternative V would have the lowest number of AUMs available for livestock; as a result, the number of AUMs allocated for areas that are predominantly cheatgrass would be lower than any other alternative. Along with Alternative IV, utilization levels of non-native vegetation would reduce fuel loads the least of all alternatives. Targeted grazing would not be allowed in this alternative. This alternative would reduce fire size the least due to livestock grazing. However, species diversity, structural complexity, and landscape stability would increase while the spread of weeds and annual grass would decrease which would increase the historical vegetation composition. Alternative V would be the best alternative for improving FRCC.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would result in slightly more AUMs for livestock than the No Action Alternative. However, along with Alternative I, the percent utilization in non-native vegetation would cause a moderate reduction in fuel loading. Targeted grazing would also be allowed in this alternative, which would help decrease fire size by reducing fuels in localized areas. Because of the percent utilization of non-native vegetation and forage allocation levels, this alternative would reduce the trend towards increased fire size more than the No Action Alternative and Alternatives IV and V. Vegetation composition and condition is expected to increase structural complexity while spread of noxious weeds and annual grass would remain at the current level or decrease slightly. This alternative would improve FRCC better than the No Action Alternative and Alternatives I, II, and III but less than Alternatives IV and V.

Impacts from Recreation Actions

The following indicator was used to analyze the impacts of Recreation actions on wildland fire and ecology management:

- Number of human-caused fires.

Recreation management changes the amount and density of people, which may change the number of fires caused by human activity during the fire season. The amount, frequency, and type of human activity can influence the number of wildland fire starts. Between 1987 and 2011, 39% of wildland fires were caused by items such as campfires, fireworks, and equipment; campfires account for 65% of fires caused by human activities, followed by equipment use, which accounts for 8%. Increases in recreational use would likely result in an increased number of human-caused fires (BLM, 1998b). However, most of the Special Recreation Management Areas (SRMAs) that would be designated in each alternative are not expected to affect the number of human-caused fires either due to the type of recreational use, the expected changes in the amount of use, or the expected management of the SRMA. The only areas which were predicted to change during the next twenty years (plan life) were those that were managed for motorized recreation. As a result, this section of the analysis focuses on the Recreation Management

Zones (RMZs) each alternative would proactively manage for motorized recreational use, primarily off-highway vehicles (OHVs).

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would continue to manage 3,000 acres in the Yahoo area for motorized recreation as part of the Hagerman-Owsley Bridge SRMA. Use of this area for motorized recreational use is expected to increase over the life of the plan. Even though the area managed for this use would remain constant, the number of human-caused fires would likely increase due to increased use. As a result, the No Action Alternative, similar to Alternatives V and VI would have the second lowest susceptibility for human-caused fires from motorized recreation use.

Impacts from Management Specific to Alternative I

Alternative I would manage 35,000 acres in the RMZs for motorized recreation, the most acres of any alternative; use of these areas is expected to increase. This alternative would have the largest footprint which allows for the most increase in number of OHVs over the life of the plan. As a result, Alternative I would have the highest susceptibility for human-caused fires from motorized recreation use.

Impacts from Management Specific to Alternative II

Alternative II would not manage any areas for motorized recreation. Since there would be no emphasis on providing opportunities for motorized recreation an increase in OHVs would not be as great as other alternatives., Alternative II would have the lowest susceptibility for human-caused fires from motorized recreational use.

Impacts from Management Specific to Alternative III

Alternative III would manage 34,000 acres in RMZs for motorized recreation. This would be fewer acres than Alternative I, the same acres as Alternative IV, and more than the rest of the alternatives. Use of these areas for motorized recreational use is expected to increase over the life of the plan and the larger footprint allows for more OHVs As a result, Alternative III would rank second highest in susceptibility for human-caused fires.

Impacts from Management Specific to Alternative IV

Alternative IV would manage the same acres and areas for motorized recreation as Alternative III; as a result, the impacts on human-caused fires from motorized recreation use would be the same as described for Alternative III.

Impacts from Management Specific to Alternative V

Alternative V would manage 3,000 acres in RMZs, the same amount of acres as the No Action Alternative and Alternative VI. Use of this area for motorized recreational use is expected to increase over the life of the plan. As a result, Alternatives V and VI and the No Action Alternative would have the second lowest susceptibility for human-caused fires from motorized recreation.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would manage the same acres and areas for motorized recreation as the No Action Alternative and Alternative V; as a result, the impacts on human-caused fires would also be the same.

Impacts from Transportation and Travel Actions

The following indicator was used to analyze the impacts of Transportation and Travel actions on wildland fire and ecology management:

- Number of human-caused fires.

Transportation and travel management changes the accessibility of the planning area. The amount, frequency, and type of human activity can influence the number of wildland fire starts. Between 2001 and 2011, 38% of wildland fires were caused by items such as campfires, fireworks, and equipment. Limiting access decreases the amount of exposure between people and fuels and, therefore, reduces fires.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 63,000 acres would be closed to motorized vehicle use. Areas open to motorized vehicles, 342,000 acres, would be a concern for fire starts especially in areas of dominated by annual vegetation. The current rate of human-caused fires, especially those fires caused by motorized vehicles, is expected increase due to increased accessibility. Transportation and travel actions in this alternative would do the least for decreasing the number of human-caused fires.

Table 4-208. Travel Designations by Vegetation Management Area in the No Action Alternative (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	118,000	900
B	99,000	47,000
C	66,000	15,000
D	59,000	0
Total	**342,000**	**63,000**

Impacts from Management Specific to Alternative I

Alternative I would have the second largest number of acres closed to motorized vehicle use in Vegetation Management Area (VMA) B, which would help reduce fire frequency in this VMA, which has highest occurrence of human-caused fire. The acres open to cross-country motorized vehicle use in Alternative I would be located in VMAs A and B, the VMAs with the highest number of human-caused fires. Fire starts from off-highway vehicles and motorcycle riding are expected to concentrated in the areas open to cross-country motorized vehicle use, rather than dispersed across a larger open area as in the No Action Alternative. This alternative would be second best at reducing the number of human-caused fires caused by transportation and travel actions.

Table 4-209. Travel Designations by Vegetation Management Area in Alternative I (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	3,000	900
B	700	69,000
C	0	25,000
D	0	20,000
Total	**4,000**	**115,000**

Impacts from Management Specific to Alternative II

Alternative II would not have any areas open to cross-country motorized vehicle use; however, it also would have the fewest acres closed to motorized vehicle use. Alternative II has the smallest number of acres closed to motorized vehicle use in VMA B, the VMA with the highest fire occurrence. Along with Alternative III, transportation and travel actions in Alternative II would do the second least at reducing the number of human-caused fires.

Table 4-210. Travel Designations by Vegetation Management Area in Alternative II (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	0	900
B	0	46,000
C	0	15,000
D	0	0
Total	**0**	**62,000**

Impacts from Management Specific to Alternative III

Alternative III would have a similar acreage closed to motorized vehicle use as Alternative II, but would increase the acreage open to cross-country motorized vehicle use. The acreage that is closed to motorized vehicle use in VMA B, the VMA with highest fire occurrence, is also similar between the two alternatives. While Alternative III has a higher number of acres closed to motorized vehicles, this is offset by the increase in acres open to cross-country motorized vehicle use. Due to the off-set and the similarity in acres of open to cross-country motorized vehicle use and closed to motorized vehicle use, Alternative III would be the similar to Alternative II in reducing the number of human-caused fires.

Table 4-211. Travel Designations by Vegetation Management Area in Alternative III (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	3,000	900
B	700	47,000
C	0	15,000
D	0	0
Total	**3,700**	**63,000**

Impacts from Management Specific to Alternative IV

Alternative IV would have the third largest number of acres closed to motorized vehicle use in VMA B, which has the highest occurrence of human-caused fires. Areas open to cross-country motorized use would be located in VMAs A and B, the VMAs with the highest number of human-caused fires. Due to similar acreage open to cross-country motorized vehicle use and areas closed to motorized vehicle use in VMA B, transportation and travel actions in this alternative would have similar impacts as Alternative I but would be third best at reducing the number of human-caused fires.

Table 4-212. Travel Designations by Vegetation Management Area in Alternative IV (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	3,000	900
B	700	50,000
C	0	20,000
D	0	28,000
Total	**3,700**	**99,000**

Impacts from Management Specific to Alternative V

Alternative V would have the largest number of acres closed to motorized vehicle use in VMAs A and B, the VMAs with the highest occurrence of human-caused fires. Due to the small number of acres open to cross-country motorized vehicle use and the large number of acres closed to motorized vehicle use, especially in VMA B, transportation and travel actions in this alternative would reduce the number of human-caused fires the most of any alternative.

Table 4-213. Travel Designations by Vegetation Management Area in Alternative V (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	0	1,000
B	700	87,000
C	0	29,000
D	0	48,000
Total	**700**	**166,000**

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI has the same number of acres in each travel designation and VMA as Alternative III. Similar to Alternatives II and III, Alternative VI would do the second least at reducing human-caused fires from transportation and travel actions.

Table 4-214. Travel Designations by Vegetation Management Area in Alternative VI (Proposed RMP) (Acres)

VMA	Open to Cross-Country Motorized Vehicle Use	Closed to Motorized Vehicle Use
A	3,000	900
B	700	47,000
C	0	15,000
D	0	0
Total	**3,700**	**63,000**

Impacts from Land Use Authorization Actions

The following indicator was used to analyze the impacts of Land Use Authorization actions on wildland fire and ecology management:

- Number of human-caused fires.

Land use authorizations increase human activity in the project area, which may change the number of human-caused fires. Human activities may increase the number of fires for a defined period of time when related to construction, such as the erection of a tower, or may increase fires substantially for a defined period of time and then have a decreased lingering effect, such as the construction of a road.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes 111,000 acres of expected wind energy development areas and 62,000 acres of right-of-way (ROW) exclusion areas. This alternative has the lowest amount of ROW exclusion areas and the second highest amount of wind energy development and would be second in increasing the amount of human-caused fires from land use authorization actions.

Impacts from Management Specific to Alternative I

In Alternative I, the expected wind energy development areas would total 39,000 acres and there would be 63,000 acres of ROW exclusion areas. This alternative would not increase human-caused fires as much as the No Action Alternative and Alternatives II and III but more than Alternatives IV, V, and VI.

Impacts from Management Specific to Alternative II

In Alternative II, the expected wind energy development areas would total 127,000 acres and there would be 62,000 acres of ROW exclusion areas. Due to the highest amount of expected wind energy development and the lowest amount of ROW exclusion this alternative would increase human-caused fires the most.

Impacts from Management Specific to Alternative III

In Alternative III, the expected wind energy development areas would total 50,000 acres and there would be 63,000 acres of ROW exclusion areas. This alternative would increase human-caused fires less than the No Action Alternative and Alternative II but more than Alternatives I, IV, V, and VI.

Impacts from Management Specific to Alternative IV

In Alternative IV, the expected wind energy development areas would total 37,000 acres and there would be 100,000 acres of exclusion. This alternative has the second highest amount of ROW exclusion areas and the third lowest amount of expected wind energy development. This alternative would increase human-caused fires less than all alternatives except for Alternative V.

Impacts from Management Specific to Alternative V

In Alternative V, the expected wind energy development areas would total 31,000 acres and there would be 167,000 acres of ROW exclusion areas. This alternative has the highest amount of ROW exclusion and next to the lowest amount of expected wind energy development which would increase human-caused fires the least.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative I, the expected wind energy development areas would total 22,000 acres and there would be 63,000 acres of ROW exclusion areas. This alternative would increase human-caused fires the least except for Alternatives IV and V.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

The No Action Alternative does not have any suppression actions that address measures such as the building of infrastructure and prevention activities for reducing fire occurrence or fire size. Management actions for land use authorizations and transportation and travel allow the largest opportunity for wildland fire starts due to the availability of area for development and cross-country motorized vehicle use. Human activity accounts for 57% of the fires and will continue to be a primary cause due to the continued recreation actions. The number of human-caused fires in this alternative would increase due to the combined impacts from land use, transportation and travel, and recreation actions with no emphasis on prevention actions.

The “full suppression” approach without an emphasis on vegetation treatments that increase the historical vegetation and modifies fuels would not return the fire regime to a less frequent large fire scenario. The amount of grazing would decrease fuel loading and not improve the amount of historical vegetation.

Overall, the No Action Alternative would rank second to last in improving Fire Regime Condition Class (FRCC; similar to Alternative III) and last in reducing the number of human-caused fires and fire size. It would result in moderate adverse impacts to FRCC, moderate adverse impacts to the number of fires, and major adverse impacts to fire size.

Impacts from Alternative I

The suppression actions in Alternative I would be focused in the same areas as Alternatives V and VI which have the second highest number of fires (59%) and a history of large fire. These actions would be augmented by the second highest amount of area closed to motorized vehicles and third highest reduction to fuel loading from grazing. Fuels treatments would increase the amount of historical vegetation, third largest, which would increase the interval between large fires and improve the FRCC rating. Decrease in rate of spread from fuels treatments would occur but not to the degree as other alternatives. Only 3% of the planning area, the lowest amount, would experience rate of spread decrease and only 4,000 acres of land would be experience a rate of spread decrease in the wildland urban interface (WUI), the third highest amount.

This alternative has the highest increase in motorized recreation and the fourth highest amount of development through land use authorizations. Grazing actions would not increase historical vegetation which would not lengthen the interval between large fires which would not improve FRCC rating.

Overall, Alternative I would rank fourth in improving FRCC, third in reducing the number of human-caused fires, and fifth in reducing fire size. It would result in moderate beneficial impacts in reducing FRCC, number of human-caused fires, and fire size.

Impacts from Alternative II

The suppression actions in Alternative II would be focused in the same areas as Alternative III which have the highest number of fires (72%) and a history of large fire. These actions would be augmented by the highest amount of the planning area (6%) which would experience a decrease in rate spread through fuels treatments and in the WUI would decrease the rate of spread on 5,000 acres the second highest

amount among the alternatives. Also, the highest reduction in fuel loading from grazing actions occur in this alternative as well as the least amount of increase in motorized recreation.

This alternative, except for the No Action Alternative has the lowest amount of area which is closed to motorized vehicles and the highest amount of development through land use authorizations. There would be no fuels treatments and therefore no increase the amount of historical vegetation or lengthening of the interval between large fires. Livestock grazing would decrease the amount of historical vegetation which would shorten the current interval (frequent) between large fires with no improvement to FRCC rating.

Overall, Alternative II would rank last in improving FRCC, fourth in reducing the number of human-caused fires (same as Alternative III), and first in reducing fire size. Alternative II would result in moderate adverse impacts to FRCC and moderate beneficial impacts in reducing number of fires and fire size.

Impacts from Alternative III

The suppression actions in Alternative III would be focused in the same areas and have the same impacts as in Alternative II. These suppression actions would be augmented by fuels treatments which would decrease the rate spread on the second highest amount of the planning area (5%). Treatments in the WUI would reduce rate of spread on 6,000 acres, the highest amount among alternatives. Also, fuels treatments would increase the amount of historical vegetation to 684,000. This would be next to the lowest increase to longer intervals between large fires and improvement to FRCC for all alternatives.

Transportation and travel management actions provide the least decrease to cross country travel by motorized vehicle with the second largest increase from motorized recreation and the third largest increase of developments from land use authorization. Grazing would have the second highest decrease in fuel loading but not increase the amount of historical vegetation and the interval between large fires nor improve FRCC rating.

Overall, Alternative III would rank second to last in improving FRCC (same as the No Action Alternative), fourth in reducing the number of human-caused fires (same as Alternative II), and second in reducing fire size. Alternative III would result in moderate adverse impacts to FRCC and moderate beneficial impacts to the number of fires and fire size.

Impacts from Alternative IV

The suppression actions in Alternative IV would be focused in areas that have the lowest number of fires (28%) and a lower amount of large fires. These actions would be augmented by the highest amount of the planning area (6%) which would experience a decrease in rate of spread through fuels treatments and in the WUI would decrease the rate of spread on 4,000 acres the third highest amount among the alternatives. Transportation and travel management actions decrease the amount of motorized cross country travel, third best, but motorized recreation increases, third highest. Developments from land use authorizations are third lowest but the second highest amount of right-of-way (ROW) exclusion areas make this alternative the next to lowest increase in human-caused fires from land use authorizations. However, the lower amount of grazing would be second to last in reducing fuel loading.

Fuels treatments would increase the amount of historical vegetation to 910,000 acres the largest amount and the amount of livestock grazing would also increase historical vegetation which would lengthen the interval between large fires and improve FRCC.

Overall, Alternative IV would rank first in improving FRCC, second in reducing the number of human-caused fires (same as Alternative VI), and fourth in reducing fire size. Alternative IV would result in major beneficial impacts to FRCC and moderate beneficial impacts to the number of fires and fire size.

Impacts from Alternative V

The suppression actions in Alternative V would be focused in the same areas as Alternatives I and VI which have the second highest number of fires (59%) and a history of large fire. This would be augmented by the most decrease in motorized cross country travel plus the next to lowest increase in developments and motorized recreation. However, the highest amount of ROW exclusion areas would make this alternative the lowest increase to human-caused fires from land use authorizations. This

alternative has next to least amount of area (3%) with a decrease in rate of spread from fuels treatments and WUI treatments (3000 acres). Decrease in fuel loading would be the least but increase in historical vegetation would be the most from grazing. Additional increase to historical vegetation would come from fuels treatments (731,000 acres) which are in the middle.

Overall, Alternative V would rank second in improving FRCC, first in reducing the number of human-caused fires, and second to last in reducing fire size. Alternative V would result in moderate beneficial impacts to FRCC, the number of fires, and fire size.

Impacts from Alternative VI (Proposed RMP)

The suppression actions in Alternative VI would be focused in the same areas as Alternatives I and V which have the second highest number of fires (59%) and a history of large fire. This would be augmented by the second lowest increase in motorized recreation, highest amount of area (6,000 acres) in the WUI with decrease in the rate of spread, and next to the most amount of historical vegetation (862,000 acres). However, the amount of the planning area which experiences a decrease in the rate of spread from fuels treatments would be in the middle when compared to other alternatives (3%) and there would next to least amount of area (3,000 acres) with a decrease in rate of spread in the WUI.

Livestock grazing would both decrease fuel loading and increase historical vegetation but the decreases and increases would be in the middle range when compared to the other alternatives. Increase in motorized recreation would be next to the least while decrease in motorized cross country travel would be next to the least. Development would be the lowest from land use authorizations but the lower amount of ROW exclusion areas make this alternative the third least increase of human-caused fires from land use authorizations.

Overall, Alternative VI would rank third in improving FRCC, second in reducing the number of human-caused fires (same as Alternative IV), and third in reducing fire size. Alternative VI would result in moderate beneficial impacts to FRCC and moderate, long-term beneficial impacts to the number of fires and fire size.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The area in which cumulative impacts were considered includes Federal and non-Federal lands within the planning area and adjacent areas managed by the Twin Falls District BLM, Elko District BLM, Humboldt-Toiyabe National Forest, and the US Air Force (USAF). Natural and human-made barriers limit the impacts to and from outside the planning area Highway 93 and Salmon Falls Creek provide a barrier on the east side of the planning area; Interstate 84 and the Snake River on the north; and the Bruneau River on the west. The greatest potential for impacts from outside the planning would be from private lands along the boundary, USAF training ranges, and Federal lands south of the planning area. These Federal lands are managed by the Humboldt-Toiyabe National Forest and the BLM's Elko District, Wells (NV) Field Office.

Past, present, and reasonably foreseeable actions for the following resources cumulatively affect wildland fire ecology and management:

- Population Growth,
- Wildland Fire Ecology and Management,
- Noxious Weeds and Invasive Plants, and
- Local Fire Suppression.

These actions are described in the *Introduction* to this chapter.

With regard to population growth and in addition to the discussion in the *Introduction*, the general trend of increasing human population would increase activities in and adjacent to the planning area resulting in an increased demand for recreation, travel, and land use authorizations. This is expected to result in an

increase in the potential for human-caused fires proportional to the increase in activity and use. The increasing population has also resulted in an increase in the amount of wildland urban interface (WUI) within and near the planning area. Any increase in the amount of WUI impacts the suppression capabilities during times when there are multiple wildland fires. Fires which involve homes, structures, and economic values are given priority over other fires, which may result in more burned acres in non-WUI areas. This results in a continued high departure from successional class (S-Class) similarity a more frequent fire return interval and larger fires in those areas. More WUI areas also would require increased emphasis on prevention and fuels treatments which moves the focus of those activities away from other areas.

With regard to wildland fire ecology and management, and in addition to the discussion in the *Introduction*, the historic range of variation in frequency and severity of wildland fire has changed from its pre-settlement conditions to the present-day situation. Most vegetation types within the Great Basin have experienced wildland fire more frequently than their historic fire return interval would indicate (McKnight, 2008). Those vegetation types and changes to their historical fire return interval are characteristic of areas within the analysis area. Other areas within the analysis area have experienced less frequent wildland fire and, as a result, the severity of wildland fires has been altered. The factors that contribute to this altered fire return interval and fire severity are predominately the result of human intervention and activities. The cumulative result has been an introduction of non-native species and alteration in the vegetation communities within the planning area beyond the natural range of variation and reference S-Classes.

Human factors that have impacted vegetation include homesteading, community development, agricultural use, road construction, decades of aggressive fire suppression practices, and livestock grazing. These factors have impacted the fire return interval by increasing fire frequency in most areas, while limiting the role of wildland fire as a natural ecosystem component in other areas. Areas that experience more frequent fire are now dominated with early-successional or uncharacteristic S-Classes. Areas that have not experienced fire due to suppression efforts are now dominated by mid- and late-successional stages with an uncharacteristic buildup of vegetation. This combination of factors results in uncharacteristically severe wildland fires across all land ownerships within and adjacent to the planning area.

Fire management practices are specified in land use plans for adjacent Federal lands managed by the BLM (Twin Falls District and Elko District), Forest Service (Humboldt-Toiyabe National Forest), and the USAF (Saylor Creek and Juniper Butte Training Ranges). All these Federal lands are managed to prevent wildland fires and emphasize wildland fire suppression in most areas. Suppression of wildland fires on State lands within or adjacent to the planning area is managed by the BLM. Suppression of wildland fires on private lands is managed by rural fire districts (RFDs) in some areas, but most private lands within the planning area have no governmental entities with jurisdictional responsibility. Wildland fires on private land areas without RFDs are usually suppressed by the BLM.

A contractual agreement exists between the Twin Falls District BLM and the USAF that requires the BLM to suppress fires emanating from the Saylor Creek and Juniper Butte Training Ranges. A fire emanating from a training range would be given the same consideration as a fire occurring in critical suppression areas when establishing priorities for multiple fires. Fires given a lower priority could increase in size compared to the same fires given a higher priority. As activities increase on the training ranges the increase in fires which require response by the BLM may increase.

Future changes in land treatments and fire management direction could also impact the planning area. National direction is, at this time, moving from a full suppression strategy to a range of options which include fully suppressing the fire to not engaging in any direct suppression activities based on risk. Improvements in chemicals, seed source, and application methods are continuing to evolve and would increase the success of vegetation treatments.

The introduction of invasive plants into the planning area has and continues to contribute to alteration of fire return interval and severity. These invasive plants have become well established in large areas since pre-settlement times and result in more frequent large fires over the same area. This increase in wildland

fire frequency has impacted the native vegetation communities, S-Classes, and Fire Regime Condition Class (FRCC) within the analysis area.

The Federal agencies have provided assistance and funds to city and county fire organizations in the last ten years to expand their capabilities to fight wildland fire in cooperation with Federal firefighting entities. However, the funding has diminished over the last several years and the continuance is not predictable. There has been an increase in the ability of local fire departments to provide immediate fire suppression on BLM-managed lands for short periods of time within the planning area primarily in the WUI.

The formation of Rural Fire Protection Associations has just recently occurred within the planning area. These local organizations are not governmental entities but are sponsored by the State and can provide local fire suppression on Federal lands. As more associations are formed this could lead to decreases in fire size.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Increases in population would increase the demand for motorized recreation and increase the amount of wildland urban interface (WUI). As the WUI increases, suppressing fires would become more complex and require the setting of priorities. Preventive measures would be needed to address the increases to recreation activities and the WUI. Local fire organizations would help offset the impacts to these increases.

Fire management objectives for adjacent land management agencies that implement wildland fire use would increase the potential for a fire to cross into the planning area boundary especially along the southern border where natural and manmade barriers to wildland fire are fewer.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds onto and within the planning area. This would decrease the trend away from the historical vegetation and shorter fire return intervals.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in Vegetation Management Areas (VMAs) A and B. Unlike city and county fire organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

Cumulative Impacts from Alternative I

Fire management objectives for adjacent land management agencies implementing wildland fire use would increase the potential for a fire to cross into the planning area boundary, especially along the southern border where there are fewer natural and manmade barriers to wildland fire.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds and invasive plants onto the planning area which would enhance improvements to FRCC. Advances to seed source, chemicals, and treatment application would increase the success of fuels treatments and enhance the improvements to FRCC.

Increases in population would increase the demand for motorized recreation and increase the amount of WUI. The WUI and motorized recreation primarily occur in VMAs A and B. However, suppression actions are focused in the middle portion of the planning unit, VMAs B and C. This would reduce the effectiveness of suppression actions in VMA C, because more of the suppression actions would be shifted to VMAs B and A.

Suppression priorities in the VMAs B and C would be affected by contractual agreement with the USAF by focusing the priority on fires in VMA A, in order to meet the contract, where the majority of the fires on the training ranges occur.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in VMAs A and B. Unlike city and county fire organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

Cumulative Impacts from Alternative II

Fire management objectives for adjacent land management agencies implementing Wildland Fire Use would increase the potential for a fire to cross into the planning area boundary, especially along the southern border where there a fewer natural and manmade barriers to wildland fire.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds and invasive plants onto the planning area which would slow the deterioration of FRCC.

Increases in population would increase the demand for motorized recreation and increase the amount of WUI. The WUI and motorized recreation primarily occur in VMAs A and B. Suppression actions are also focused in VMAs A and B. This effectiveness of suppression actions would compensate for the increase in the WUI and recreation activities under this alternative.

Suppression priorities in the VMAs A and B would be affected by contractual agreement with the USAF by focusing the priority on fires in VMA A, where the majority of the fires on the training ranges occur. However, this effect would be the same as Alternative III and would be less than other alternatives.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in VMAs A and B. Unlike city and county fire organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

Cumulative Impacts from Alternative III

Fire management objectives for adjacent land management agencies implementing wildland fire use would increase the potential for a fire to cross into the planning area boundary, especially along the southern border where there are fewer manmade and natural barriers.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds and invasive plants onto the planning area which would enhance improvements to FRCC. Advances to seed source, chemicals, and treatment application would increase the success of fuels treatments and enhance the improvements to FRCC.

Increases in population would increase the demand for motorized recreation and increase the amount of WUI. The WUI and motorized recreation primarily occur in VMAs A and B. Suppression actions are also focused in VMAs A and B. This effectiveness of suppression actions would compensate for the increase in the WUI and recreation under this alternative.

Suppression priorities in VMAs A and B would be affected by contractual agreement with the USAF by focusing the suppression priority on fires in VMA A, in order to meet the contract, where the majority of the fires on the training ranges occur. However, this effect would be the same as Alternative II and would be less than other alternatives.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in VMAs A and B. Unlike city and county fire organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

Cumulative Impacts from Alternative IV

Fire management objectives for adjacent land management agencies implementing wildland fire use would increase the potential for a wildland fire to cross into the planning area boundary, especially along the southern border where there are fewer natural and manmade barriers to wildland fire. However, fire suppression actions are primarily focused in the southern portion, VMAs C and D, of the planning area which would mitigate the encroachment of fires onto the planning area.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds and invasive plants onto the planning area which would slow the deterioration of FRCC. Advances to seed source, chemicals, and treatment application would increase the success of fuels treatments and enhance the improvements to FRCC.

Increases in population would increase the demand for motorized recreation and increase the amount of WUI. The WUI and motorized recreation primarily occur in VMAs A and B. This would reduce the effectiveness of suppression actions because suppression actions are focused VMAs C and D, as the increase in human-caused fires would be in the northern portion of the planning area.

Suppression priorities in VMAs C and D would also be affected by contractual agreement with the USAF by focusing the priority on fires in the northern portion of the planning unit where the majority of the fires on the training ranges occur.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in VMAs A and B. Unlike city and county fire organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

Cumulative Impacts from Alternative V

Fire management objectives for adjacent land management agencies implementing wildland fire use would increase the potential for a fire to cross into the planning area boundary, especially along the southern border.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds and invasive plants onto the planning area which would enhance improvements to FRCC. Advances to seed source, chemicals, and treatment application would increase the success of fuel treatments and enhance the improvements to FRCC.

Increases in population would increase the demand for motorized recreation and increase the amount of WUI. The WUI and motorized recreation primarily occur in VMAs A and B. Suppression actions are focused in the middle portion of the planning unit, VMAs B and C. This would reduce the effectiveness of suppression actions in VMA C because more of the suppression actions would be shifted to VMAs B and A.

Suppression priorities in VMAs B and C would also be affected by contractual agreement with the USAF by focusing the priority on fires in VMA A, where the majority of the fires on the training ranges occur.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in VMA A and B. Unlike city and county fire

organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

Cumulative Impacts from Alternative VI (Proposed RMP)

Fire management objectives for adjacent land management agencies implementing wildland fire use would increase the potential for a fire to cross into the planning area boundary, especially along the southern border.

Improved management for noxious weeds and invasive plants by adjacent land managers would decrease the spread of noxious weeds and invasive plants onto the planning area which would enhance improvements to FRCC. Advances to seed source, chemicals, and treatment application would increase the success of fuel treatments and enhance the improvements to FRCC.

Increases in population would increase the demand for motorized recreation and increase the amount of WUI. The WUI and motorized recreation primarily occur in VMAs A and B. Suppression actions are focused in the middle portion of the planning unit, VMAs B and C. This would reduce the effectiveness of suppression actions in VMA C because more of the suppression actions would be shifted to VMAs B and A.

Suppression priorities in the VMAs B and C would also be affected by contractual agreement with the USAF by focusing the priority on fires in VMA A, where the majority of the fires on the training ranges occur.

City and county fire organizations are located along the northern and eastern border of the planning area and provide suppression assistance within a short distance of their protection districts especially in the WUI which would augment the suppression actions in VMAs A and B. Unlike city and county fire organizations rural fire protection associations may not have identified geographic boundaries and could be located anywhere in the planning area. Increased capabilities and availability of local fire organizations would help offset impacts which would tend to increase fire size particularly in the WUI.

4.3.10. Wild Horses

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to wild horses:

- **Genetic diversity of the herd** – Herd size, or the effective reproducing population, influences the genetic diversity of a wild horse herd by affecting the size of the gene pool. A population size of 50 effective reproducing animals (i.e., a total population size of 150 to 200 wild horses) is recommended (Cothran, 2009) to maintain adequate genetic diversity (avoid inbreeding depression). Herds managed over several decades at less than 100 animals risk becoming inbred (Singer and Zeigenfuss, 2000), decreasing fitness and making the herd more susceptible to disease and physical infirmities. Because the Saylor Creek Herd Management Area (HMA) is geographically isolated from other HMAs, the Saylor Creek wild horse herd has no opportunity for natural genetic mixing with animals from adjacent herds; as a result, the herd must rely on the genetic pool within the herd to provide adequate genetic diversity.
- **Amount of forage available to wild horses** – The allocation of vegetation production for resources (e.g., watershed and wildlife) and resource uses (e.g., livestock grazing) affects whether sufficient vegetation would be available for wild horse forage needs. Insufficient forage would cause stress and decrease the general health of the wild horse herd. Management that would maintain or improve rangeland health (e.g., soil stability, vegetation) within the HMA would sustain forage availability to the wild horse herd in the long term.
- **Amount of water available to wild horses** – Because natural water is not available in the HMA, wild horses are dependent on water developments for their water needs. As a result, management that

would affect water developments would also affect wild horses. Not only do these water developments provide a water source for wild horses, they also affect distribution of wild horses within the HMA.

- **Level of disruption to wild horses in the HMA** – Wild horses can be disrupted or disturbed by interference with their movements or behavior within the HMA. Fewer constraints on wild horse movement and less interference with their behavior can increase the portion of the HMA used by wild horses, increasing access to forage and decreasing impacts to rangeland health. Wild horses also benefit from being able to move to areas to escape human disturbance. Wild horse movement and behavior within the HMA can be impeded by multiple factors, including physical barriers (e.g., fences) as well as human activities.

Methods and Assumptions

Impacts to wild horses from management in the following sections of Chapter 2 were analyzed in detail: *Wild Horses*, *Upland Vegetation*, *Wildland Fire Ecology and Management*, *Livestock Grazing*, *Transportation and Travel*, *Land Use Authorizations*, and *Leasable Minerals*. Impacts from management in the *Recreation* section were not analyzed in detail because the impacts were captured in the analysis of transportation and travel management actions. Impacts from management in the remaining sections were not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for wild horses. Impacts from management for wild horses can be found under *Impacts from Wild Horses Actions* in the *Livestock Grazing* section.

The analysis of impacts on wild horses includes both qualitative and quantitative components. Where management that would affect wild horses can be depicted spatially, geographic information system analyses were conducted to quantify the geographic extent of the impact. However, many management actions that would affect wild horses cannot be depicted spatially; in these cases, a qualitative analysis was conducted to characterize impacts to wild horses and the HMA.

Because wild horses are restricted to the Saylor Creek HMA, the analysis only considers actions that would result in effects to the wild horses or the HMA; effects of actions that would occur outside the HMA were not included. For example, the analysis of impacts of upland vegetation actions in the HMA only considers actions that would occur in Vegetation Management Area (VMA) A. For comparison purposes and to show differences between alternatives, it is assumed the relative proportions of vegetation sub-groups within VMA A are the same as within the HMA. This assumption was made for analysis purposes because the location of specific vegetation treatments within VMA A would be determined at the implementation level.

Assumptions were developed based on interdisciplinary team knowledge of wild horses and the HMA. These assumptions should not be construed to confine or redefine management contained within alternatives and were used to allow a comparison of impacts to wild horses resulting from the alternatives. Assumptions used in the analysis of impacts to wild horses include:

- Comprehensive management of wild horses and the HMA would benefit from establishment of an appropriate management level (AML) based on forage and water availability.
- Comprehensive management of wild horses would benefit from developing and implementing a Herd Management Area Plan.
- Wild horses and the HMA would benefit from management actions that keep the wild horse herd to numbers within the AML.
- Some trauma and injuries would result from capture and relocation to holding facilities. Wild horses experience stress associated with the roundup, transport, and holding of the animals. Stress quickly diminishes as the animals become accustomed to new surroundings.
- Management actions that allow greater motorized vehicle access to wild horses or the HMA would increase human activity and disturbance to the wild horse herd.
- Areas unavailable for livestock grazing would also be unavailable to wild horses.

AML Analysis

AML decisions determine the number of wild horses to be managed within an HMA or complex of HMAs. AML is expressed as a population range with an upper and lower limit. The AML upper limit is the number of wild horses which results in a Thriving Natural Ecological Balance (TNEB) and avoids a deterioration of the range. The AML lower limit is normally set at a number that allows the population to grow to the upper limit over a four to five year period, without any interim gathers to remove excess wild horses.

Appendix 3 of the Wild Horse and Burro Handbook (H-4700-1, 2010) recommends a multi-tier analysis process to establish and adjust the AML.

- **Tier One**: Determine whether the four essential habitat components (forage, water, cover, and space) are present in sufficient amounts to sustain healthy wild horse populations and healthy rangelands over the long term. Should the tier one analysis determine that one or more of the essential habitat components is insufficient to maintain a healthy wild horse population and healthy rangelands, the authorized officer should consider amending or revising the land use plan to remove the area's designation as an HMA.
  - The tier one analysis for the Saylor Creek HMA revealed forage availability, cover, and open space would be adequately provided by all alternatives. Natural occurring water was the one factor that failed to provide the minimum required to sustain a healthy wild horse herd because perennial natural water does not occur within the Saylor Creek HMA. All water for wild horses and domestic livestock is provided through four different pipeline systems supplied by wells on both BLM-managed and private lands. Alternatives maintaining a wild horse herd in the Saylor Creek HMA would require frequent monitoring and maintenance by permittees and the BLM to ensure constant water is available. These impacts are discussed for each alternative.

- **Tier Two**: Determine the amount of sustainable forage available for wild horse use.
  - The calculation of available forage in the HMA was performed using the same protocol used for estimating available forage for livestock grazing allocations across the planning area (Crane, 2013). This analysis predicts total forage production would range from approximately 63,000 up to 66,000 animal unit months (AUMs) available depending upon achievement of upland vegetation objectives at full implementation of each alternative.

- **Tier Three**: Determine whether the projected wild horse herd size is sufficient to maintain genetically diverse wild horse populations (i.e., avoid inbreeding depression).
  - This analysis indicates genetic diversity would be maintained in alternatives with reproducing herds but would require periodic testing to determining if introduction of new genetic material (i.e., mares from other HMAs) would be necessary. These impacts are discussed for each alternative. Based on the 2010 baseline genetic tests taken following the emergency gather (see Chapter 3, Wild Horses) the herd does not show any decreased genetic fitness. Based on the 2010 results the herd doesn't need to be retested for 6 to 10 years (i.e., every other gather). If testing in the future indicates genetic fitness is affected, genetic concerns could be mitigated through site-specific analysis. Possible management actions to mitigate genetic concerns are listed under the No Action Alternative.

Direct and Indirect Impacts

Impacts from Wild Horse Actions

The following indicators were used to analyze the impacts of Wild Horse actions on wild horses:

- Genetic diversity of the herd,
- Amount of forage available to wild horses,
- Amount of water available to wild horses, and
- Level of disruption to wild horses in the Herd Management Area (HMA).

The HMA occupies approximately 6.5% of the planning area. Allocation to wild horses would be less than 6% of available forage at the planning area scale. The allocation of forage to wild horses would range from 0% to 162% relative to livestock within the HMA.

Table 4-215. Allocation of Forage (Animal Unit Months) for Wild Horses and Livestock in the Saylor Creek Herd Management Area by Alternative if Vegetation Objectives are Achieved

Forage Allocation	Alternative						
	No Action	I	II	III	IV	V	VI
Allocation to Wild Horses [A]	600	2,400	0	7,200	2,400	6,000	2,400
Allocation to livestock within the HMA (AUMs)[B]	10,000 to 17,000	15,000 to 21,000	33,000 to 40,000	25,000 to 31,000	8,000 to 12,000	4,000 to 7,000	18,000 to 27,000

[A] Allocation of forage to wild horses would be for the upper range of AML to ensure constant availability of forage and assumes a wild horse requires one AUM of forage per month for 12 months of the year.
[B] AUMs at initial implementation of the plan are an estimate of forage that would be available for livestock based on the vegetation allocation and the areas available for livestock grazing by alternative, combined with the 2006 vegetation production data. The AUMs used in the analysis are estimates of forage availability at the planning area scale and are provided to assist the reader in comparing the effects of the alternatives. The number of AUMs available may actually be more or less than what is represented when project-level analysis of grazing permits is completed but would remain within the range of allocation percentages described.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would establish a reproducing herd with an AML of 50 wild horses. An AML this low may result in loss of genetic diversity by limiting the number of reproducing animals, subsequently limiting the gene pool. Due to small herd size and no opportunity for exchange of genetic material with adjacent wild horse herds, the long-term genetic diversity of the Saylor Creek wild horse herd would be more difficult to maintain than the Alternatives I, III, and VI because they include reproducing herds with higher AMLs. The impact would be minor to moderate if proactive measures to conserve genetic diversity of the herd were implemented. These measures might include options such as:

- Maximize the number of breeding age wild horses (6 to 10 years) within the herd.
- Adjust the sex ratio in favor of males to increase the number of harems and effective breeding males.
- Periodically introduce young reproducing females from other herds living in similar environments (i.e., other Idaho HMAs).

Allocating 600 AUMs to wild horses to maintain the wild horse herd at 50 animals would maintain or improve rangeland health and forage availability by limiting the extent of effects such as local overuse of vegetation and heavy soil disturbance near watering, loafing, and favored grazing areas. Development and implementation of a Wild Horse Herd Management Area Plan, together with management and monitoring objectives, would maintain the health of the wild horse herd to ensure adequate forage and water is available on the HMA. Maintenance of wild horse numbers at or near a population of 50 animals is critical to achieve the level of impacts identified in this alternative. This could include wild horse gathers or other population control methods, which would disrupt the wild horses.

Competition between wild horses and authorized livestock grazing for forage and water is expected, but maintaining the wild horse herd at 50 animals would limit these minor effects on forage and water availability to local areas.

Impacts from Management Specific to Alternative I

Alternative I would establish a reproducing herd with an AML of 100 to 200 wild horses and could have minor risks of negative, long-term effects on the genetic diversity of the wild horse herd. The AML established in Alternative I would decrease the risk of losing genetic diversity as compared to the No Action Alternative by increasing the gene pool (i.e., the number of effective breeding animals in the herd).

As described in the No Action Alternative, proactive measures are available that can be implemented to help mitigate genetic concerns so the risk to long-term genetic viability would be minor.

Allocation of forage for wild horses would be 2,400 AUMs to ensure adequate forage is available as the population reaches the upper range of the AML. Competition between wild horses and authorized livestock grazing for forage and water at localized areas would increase from the No Action Alternative. Because the season of use and distribution of grazing by wild horses cannot be intensively managed, some decreases in rangeland health, and potentially forage production, over the life of the plan would be expected in localized areas. Because wild horse grazing cannot be intensively managed but domestic livestock can, some adjustments to livestock management may be necessary on an allotment-specific basis to maintain or improve rangeland health. Improving water availability would improve wild horse access and distribution throughout the HMA, reducing the opportunity for localized heavy forage use and unwanted negative impacts to rangeland health. Reconfiguration of fences is projected to be minimal in maintaining rangeland health.

Restrictions on travel during foaling, and not allowing commercial Special Recreation Permits (SRPs), would increase mare and foal security by decreasing disruption to mares and their foals.

Impacts from Management Specific to Alternative II

The HMA would be managed as an unpopulated herd area[5]. A DNA test of the Saylor Creek wild horse herd was performed following the 2010 emergency gather. The test found the genetic makeup is average for feral wild horse herds with no trace back to Spanish decent. Reducing the Saylor Creek herd to zero would result in a negligible loss of genetic diversity. Managing the Saylor Creek wild horses as a non-reproducing herd would result in a negligible loss of genetic diversity.

There would be a moderate short-term increase of stress to the wild horses currently in the HMA due to the gather, subsequent adoptions, and relocation to other HMAs or long-term holding facilities. The initial gather of wild horses would place pressure on the National Wild Horse and Burro Program to either adopt the animals or house them in long-term holding facilities, but this would be a one-time impact as there would be no need for additional gathers.

Removal of wild horses would eliminate impacts due to wild horses to rangeland health in the HMA.

Impacts from Management Specific to Alternative III

Alternative III would increase the AML to a reproducing herd of 200 to 600 wild horses and would be expected to maintain adequate genetic diversity (Coates-Markle, 2000). Reconfiguration of allotment and pasture fences may be necessary to reduce disruption to wild horse movements within the HMA and increase the opportunity for the larger herd to disperse into smaller reproducing bands (harems), allowing increased reproducing opportunity for different males.

Allocation of forage for wild horses would be 7,200 AUMs to ensure adequate forage is available as the population reaches the upper range of the AML. Maintaining a herd of 200 to 600 wild horses would increase the impacts on rangeland health in the HMA relative to the No Action Alternative and Alternatives I, II, IV, and VI. As the wild horse population approaches 600, localized over-grazing would increase in areas resulting in destabilizing soils, decreasing vigor of vegetation, and potentially decreasing forage production over the life of the plan. Adjustments to livestock numbers and seasons of use to accommodate wild horse numbers on an allotment-by-allotment basis would mitigate some of the effects of increased wild horse numbers on rangeland health. Currently, allotment and pasture configuration restrict wild horses from freely accessing the entire HMA. Reconfiguring allotment and pasture fences to provide additional access to more areas within the HMA would improve distribution of wild horses throughout the HMA decreasing local impacts to rangeland health. However, moderate to major long-term effects to forage productivity due to localized over-grazing and soil disturbance are anticipated due to the lack of control of rotation or seasons-of-use of wild horse grazing within the HMA. Removal or relocation of fences would be determined through site-specific analysis. More active

[5] The HMA designation would be removed, but by law, the area's designation as a Herd Area would remain.

management such as controlling water availability to encourage a seasonal rotation and improve distribution of wild horses would be necessary to minimize local effects on vegetation and soil stability. Because all water supplied to the HMA is through artificial systems developed for livestock and wild horses, frequent monitoring and maintenance would be required to ensure constant water is supplied to wild horses. Decreases in authorized grazing would increase the BLM's responsibility for monitoring and maintenance of the water systems.

Restrictions on travel during foaling, and not allowing commercial SRPs, would increase mare and foal security by decreasing disruption to mares and their foals.

Impacts from Management Specific to Alternative IV

Alternative IV would establish a non-reproducing herd with an AML of 100 to 200 wild horses in the HMA. A DNA test of the Saylor Creek wild horse herd was performed following the 2010 emergency gather. The test found the genetic makeup is average for feral wild horse herds with no trace back to Spanish decent. Managing the Saylor Creek wild horses as a non-reproducing herd would result in a negligible loss of genetic diversity.

An initial gather of wild horses currently in the HMA would be required, creating a short-term increase of stress to wild horses; however, future gathers would be limited to emergency situations and removal of horses unlawfully released in the HMA. The HMA would be repopulated with wild horses meeting the population criteria from the original herd or animals currently being held in holding facilities. The priority for selection of animals would be surplus wild horses from Idaho HMAs and then wild horses from other states if horses from Idaho HMAs do not meet the mid-point AML after ten years.

Allocation of forage for wild horses would be 2,400 AUMs to ensure adequate forage is available at the upper range of the AML. The effects of the availability of forage and water on wild horses would be similar to Alternative I. Because all water supplied to the HMA is through artificial systems developed for livestock and wild horses, frequent monitoring and maintenance would be required to ensure constant water is supplied to wild horses. Decreases in authorized grazing would increase the BLM's responsibility for monitoring and maintenance of the water systems. Maintaining a non-reproducing wild horse herd may reduce the instinct of males to breech fences to intermingle and challenge for control of neighboring bands. Maintaining dispersal of bands of wild horses throughout allotments in the HMA would help prevent the bands from reforming into large herds, decreasing localized effects of wild horse grazing relative to alternatives managing for reproducing wild horse herds

The lack of seasonal travel restrictions would have minor, temporary effects on the security of wild horses as there would be no foaling.

Impacts from Management Specific to Alternative V

Alternative V would establish a non-reproducing herd with an AML up to 200 to 500 wild horses. A DNA test of the Saylor Creek wild horse herd was performed following the 2010 emergency gather. The test found the genetic makeup is average for feral wild horse herds with no trace back to Spanish decent. Managing the Saylor Creek wild horses as a non-reproducing herd would result in a negligible loss of genetic diversity.

An initial gather of wild horses currently in the HMA would be required, creating a short-term increase of stress to wild horses; however, future gathers would be limited to emergency situations and removal of horses unlawfully released in the HMA. The HMA would be repopulated with wild horses meeting the population criteria from the original herd or animals currently being held in holding facilities. The priority for selection of animals would be surplus wild horses from Idaho HMAs and then wild horses from other states if horses from Idaho HMAs do not meet the mid-point AML after ten years.

Allocation of forage for wild horses would be 6,000 AUMs to ensure adequate forage is available at the upper range of the AML. The effects of forage and water availability on wild horses would be similar to Alternative III. Adjustments to livestock numbers and seasons of use would be necessary to accommodate and to mitigate some of the effects of increased wild horse numbers on rangeland health. Because all water supplied to the HMA is through artificial systems, frequent monitoring and maintenance

to ensure water is constantly available to wild horses would be required. Decreases in authorized grazing would increase the BLM's responsibility for monitoring and maintenance of the water systems. Additional effects may also be mitigated by improving water availability and reconfiguring allotment and pasture fences to improve distribution of wild horses throughout the HMA. More active management to encourage seasonal rotations and improve distribution of wild horses would be necessary to minimize localized impacts on vegetation and soil stability. Maintaining a non-reproducing wild horse herd may reduce the instinct of males to breech fences to intermingle and challenge for control of neighboring bands. Improving control of bands of wild horses dispersed throughout allotments in the HMA would help prevent large herds from forming and would decrease localized effects of wild horse grazing. Moderate to major long-term local effects to the resources are anticipated due to the lack of control of rotation and seasons of use of wild horse grazing within the HMA.

The lack of seasonal travel restrictions would have minor, temporary effects on the security of wild horses as there would be no foaling.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would manage the HMA for a TNEB. Alternative VI would establish a non-breeding wild horse herd with an AML of 50 to 200 wild horses. A DNA test of the Saylor Creek wild horse herd was performed following the 2010 emergency gather. The test found the genetic makeup is average for feral wild horse herds with no trace back to Spanish decent. Managing the Saylor Creek wild horses as a non-reproducing herd would result in a negligible loss of genetic diversity.

An initial gather of wild horses currently in the HMA would be required, creating a short-term increase of stress to wild horses; however, future gathers would be limited to emergency situations and removal of horses unlawfully released in the HMA. The HMA would be repopulated with wild horses meeting the population criteria from the original herd or animals currently being held in holding facilities. The priority for selection of animals would be surplus wild horses from Idaho HMAs and then wild horses from other states if horses from Idaho HMAs do not meet the mid-point AML after ten years.

Allocation of forage for wild horses would be 2,400 AUMs to ensure adequate forage is available as the population reaches the upper range of the AML. Competition between wild horses and authorized livestock grazing for forage and water at localized areas would increase from the No Action Alternative and be similar to Alternatives I and IV. Because all water supplied to the HMA is through artificial systems developed for livestock and wild horses, frequent monitoring and maintenance of the water systems would be required to ensure constant water is supplied to wild horses. Because the season of use and distribution of grazing by wild horses cannot be intensively managed, some minor to moderate localized decreases in rangeland health, and potentially forage production, over the life of the plan, would be expected. Maintaining a non-reproducing wild horse herd may reduce the instinct of males to breech fences to intermingle and challenge for control of neighboring bands. Maintaining dispersal of bands of wild horses throughout allotments in the HMA would help prevent the bands from reforming into large herds and would decrease localized effects of wild horse grazing relative to alternatives managing for reproducing wild horse herds. However, because livestock grazing can be managed, some adjustments to livestock management may be necessary on an allotment-specific basis in order to mitigate effects of wild horse grazing on rangeland health. Improving water availability would improve wild horse access and distribution throughout the HMA, reducing the opportunity for localized heavy forage use and unwanted impacts to rangeland health. The necessity to reconfigure fences is projected to be minimal in order to maintain rangeland health.

The lack of seasonal travel restrictions would have minor, temporary effects on the security of wild horses as there would be no foaling.

Impacts from Upland Vegetation Actions

The following indicators were used to analyze the impacts of Upland Vegetation actions on wild horses:

- Amount of forage available to wild horses and
- Level of disruption to wild horses in the Herd Management Area (HMA).

Changes in vegetation sub-groups (VSGs) within the HMA due to vegetation treatments or wildland fire can affect the amount of forage available to wild horses. VSGs dominated by perennial grasses tend to provide a more stable forage base than VSGs dominated by annual grasses because annual grass production is highly dependent on the amount and timing of precipitation (Hull, 1949). Annual grass production can vary from a few hundred to several thousand pounds per acre (Hull, 1949) from year to year. As a result, the Annual VSG provides an unpredictable forage base for wild horses. Additionally, annual grass invasion has been demonstrated to substantially alter fire regimes by increasing fire return intervals, rate of spread, fire intensity, and size of wildland fires (Balch et al., 2012). Annual grasses mature earlier in the season than perennial plants. As the annual grasses dry out, they become available as fuel for wildland fire four to six months earlier and remain available as fuel one to two months later than perennials; thereby lengthening the fire season (Platt and Jackman, 1946). Longer fire seasons and increased risk of wildland fire increase threats to forage availability through immediate loss of forage as well as threats to long-term productivity of the rangeland within the HMA. The health of individual horses is threatened directly by physical bodily harm by fire.

Table 4-216 displays changes in upland vegetation composition in the Saylor Creek HMA.

Table 4-216. Change in Vegetation Composition in the Saylor Creek Herd Management Area (Percent)

VSG	Alternative						
	No Action	I	II	III	IV	V	VI
Annual [A]	38[C]	25	15	19	15	28	25
Perennial [B]	62[C]	75	85	78[D]	85	72	75

[A] 33% of Vegetation Management Area (VMA) A currently contains Annual VSG.
[B] This category includes the Non-Native Perennial, Non-Native Understory, Native Grassland, and Native Shrubland VSGs; 68% of VMA A currently contains perennial VSGs.
[C] The No Action Alternative does not segregate vegetation treatments by VMA; overall, across the planning area, the relative proportions of annual and perennial VSGs would change little as a result of vegetation treatments contained in this alternative.
[D] 3% of the area could be unvegetated areas.

Impacts from Management Specific to the No Action Alternative

The effect of actions for upland vegetation would be an increase in the relative proportion of perennial communities through conversion of annual communities and removal of shrubs in non-native understory communities. Converting annual grasslands to non-native perennial grasslands would increase the stability of forage in the HMA by increasing fire return intervals and reducing the wide range of yearly production common in annual grasslands. Vegetation treatments to convert annual communities to perennial would disrupt wild horses during implementation; however, the No Action Alternative has fewer treatments relative to all action alternatives. Increasing fire return intervals would decrease the number and size of wildland fires in the HMA, thereby decreasing the disruption to wild horses due to fire activity, suppression efforts, and rehabilitation of burned areas.

Impacts from Management Common to All Action Alternatives

Management actions emphasize protection of existing vegetation and newly treated areas by providing for the proper use of resources during seasonal periods or climatic events when the vulnerability of plant communities is increased. These actions would improve the stability of the plant communities thereby stabilizing forage available to wild horses.

Impacts from Management Specific to Alternative I

Management in Alternative I would change the composition of VMA A to contain a greater proportion of plant communities dominated by mid- and late-successional perennial vegetation (from 62% to 75% of VMA A). The Non-Native Perennial VSG would remain dominant (43% of VMA A); treatments would focus on converting plant communities from non-native to native. Increasing the proportion of perennial vegetation over annual would improve the stability of forage available to the wild horse herd in the long term. In the short term, vegetation treatment projects would disrupt wild horses during restoration project implementation. The scale of the restoration treatments would determine the extent of the impacts to wild

horses. Management actions may include exclusion through temporary fencing, gathering and reducing numbers, or moving the entire herd to short-term holding facilities. Alternative I would have the least number of acres treated in VMA A of all the alternatives, and would likely have the lowest level of disruption to wild horses during vegetation treatments.

The natural succession of shrubs in the Native Grassland VSG, currently 2% of the HMA, could reduce forage availability over the long term. Increased shrub cover would decrease herbaceous production through increased competition between shrubs, grasses, and forbs. At canopy coverage of 12% to 15%, competition begins to decrease the understory herbaceous component (Winward, 1991). However due to the limited seed source for natural succession of sagebrush to occur, development of a shrub overstory would occur over a long period of time (greater than 20 years) and would have a negligible effect on forage availability. The creation of 820 acres of reference areas in the HMA would not have a measurable impact on forage availability.

Impacts from Management Specific to Alternative II

The wild horse herd would be depopulated under Alternative II. The effects of vegetation treatments on forage availability and levels of disruption would not affect wild horses. The creation of reference areas, including 40 acres of the HMA, would not impact forage availability.

Impacts from Management Specific to Alternative III

The impacts of Alternative III would be similar to Alternative I, except treatments are designed to reduce the amount and continuity of fine fuels. The relative proportion of perennial VSGs (predominantly the Non-Native Perennial VSG) within the HMA would increase from 62% to 78% and the Annual VSG would decrease from 38% to 19% of VMA A. Conversions would primarily be with fire-resistant or tolerant non-native species. The shift in dominance from annual invasive to perennial vegetation would increase plant community resilience to fire disturbance (Monsen, 1994), shortening vegetation recovery following wildland fire. Conversion from annual to perennial would stabilize forage available to the wild horses and reduce disruption caused by fires. Alternative III would have the second fewest acres treated in VMA A of the action alternatives, and, therefore, would likely be the second least disruptive to wild horses during vegetation treatments. The creation of reference areas including 200 acres of the HMA would not have a measurable impact on forage availability.

Impacts from Management Specific to Alternative IV

Alternative IV would create a landscape dominated by perennial vegetation, emphasizing the amount and continuity of mid-successional native shrubland communities. The relative proportion of perennial VSGs would increase from 62% to 85% of VMA A through conversion of annual, non-native perennial, and non-native understory communities. Diversification of native grassland communities through natural succession of shrubs would occur with some seeding and planting of shrubs in existing non-native perennial communities. This process of natural succession would take a minimum of about 20 years within the Wyoming Sagebrush Steppe potential natural vegetation group and is unlikely to reach the late-successional stage in less than 40 years.

Alteration of the plant communities as described above would stabilize the forage base of the HMA. Long-term effects may occur as a result of increased shrub canopy, decreasing forage production due to competition between grasses and shrubs (Davies et al., 2007; Winward, 1991) but would occur over an extended period of time (i.e. more than 20 years), resulting in a negligible effect on forage availability during the life of this plan.

Alternative IV would have the third highest number of acres treated in VMA A of all the alternatives and would have the third highest level of disruption to wild horses during vegetation treatments. The creation of reference areas, including 820 acres of the HMA, would not have a measurable impact on forage availability.

Impacts from Management Specific to Alternative V

Impacts of actions specific to Alternative V would be similar to Alternative IV except the relative proportion and continuity of perennial VSGs would increase from 62% to 72% of VMA A. Conversion would be to

native vegetation using primarily natural succession. Long-term impacts due to reduced forage production from competition between grasses and shrubs would be lower than in Alternative IV due to the increased emphasis on natural succession processes resulting in a longer period of time to reach upland vegetation objectives.

Alternative V would have the third fewest acres treated in VMA A of the action alternatives and would have the third lowest level of disruption to wild horses during vegetation treatments. The creation of reference areas, including 13,000 acres of the HMA, would decrease forage availability.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would change the composition of VMA A to contain a greater proportion of plant communities dominated by perennial vegetation (from 62% to 75% of VMA A), emphasizing native shrub communities. Actions to increase the proportion of perennial vegetation over annual would improve the stability of forage available to the wild horse herd in the long term. Disruptions to wild horses would occur during restoration efforts. The scale of the restoration treatments would determine the extent of the impacts to wild horses due to management of the wild horse herd to meet treatment objectives.

The allowance of natural succession of shrubs in the Native Grassland VSG, currently 2% of the HMA, would reduce forage availability over the long term (i.e. more than 20 years). Increased shrub cover would decrease herbaceous production through increased competition between shrubs, grasses, and forbs. At canopy coverage of 12% to 15%, competition begins to decrease the understory herbaceous component (Winward, 1991). Due to the limited availability of a seed source for natural succession of sagebrush to occur, development of a shrub overstory would occur over a long period of time and would have a negligible effect on forage availability over the life of the plan. The creation of reference areas, including 820 acres of the HMA, would not have a measurable impact on forage availability.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on wild horses:

- Amount of forage available to wild horses and
- Level of disruption to wild horses in the Herd Management Area (HMA).

Wildland fire ecology and management includes elements of fire suppression capabilities, fuels management, and emergency stabilization and burned area rehabilitation (ES&BAR). Wildland fire can impact forage production but the impact can either increase or decrease forage availability. Wildland fire temporarily decreases forage available to wild horses in the HMA immediately following a wildland fire. As the area recovers from fire, the acres of grassland vegetation would increase, increasing the amount of forage available for wild horses. Improving wildland fire suppression capabilities that limit the spread, size, and intensity of wildland fires would improve rangeland health in the HMA and stabilize forage availability by reducing the short-term forage reductions immediately following wildland fire. Improving suppression capabilities would also increase security of the wild horses by reducing risk of injury, and disturbance during suppression activities and post fire recovery efforts. Vegetation treatments to achieve fuels management objectives would stabilize animal unit months by managing vegetation to move toward Fire Regime Condition Class (FRCC) 1. ES&BAR actions would stabilize soils, return burned areas to productive plant communities, and restore or potentially increase forage available for wild horses.

Management related to wildland fire can also affect the degree to which wild horses are disrupted within the HMA. Any actions that reduce the size or occurrence of wildland fires would increase the safety and reduce the disruption to wild horses, both directly through the fire and fire suppression activities and indirectly through post-fire effects on forage. The use of temporary fences may also reduce disruption caused by wildland fires by allowing wild horse access to unburned areas following the fire.

Impacts from Management Specific to the No Action Alternative

The HMA would continue to be managed for full suppression; however, because the entire planning area falls in this category, the No Action Alternative does not prioritize areas for fire suppression efforts.

However, the HMA and wild horses have been identified as an important resource, with appropriate suppression tactics identified for the HMA. The No Action Alternative does not prioritize areas for fuels treatments or suppression; however, negligible effects to wild horses are anticipated because wild horses are identified as a high priority resource and appropriate suppression tactics identified for the HMA.

Impacts from Management Common to All Action Alternatives

Using the appropriate management response for wildland fires would have a major long-term effect on rangeland health, improving forage availability in the HMA and reducing levels of disruption to wild horses by reducing impacts from wildland fire.

The goal for fuels and ES&BAR actions would be to reduce wildland fire hazards within the wildland urban interface (WUI). The HMA is not within the WUI but is adjacent to two areas that are. Implementation of fuels treatments within and around the WUI would decrease the risk of wildland fire starts within WUI areas from expanding into the HMA and affecting the wild horses. Management actions would reduce fire size and occurrence within the HMA and disruption caused by fire, increasing the safety of the wild horse herd and the stability of the forage base. Actions prescribed under ES&BAR would ensure quicker recovery following wildland fire events, improving the quantity and quality of the forage base in the HMA.

Impacts from Management Specific to Alternative I

The HMA would not be within a critical suppression area and suppression priorities during multiple fire starts identify VMA A, which contains the HMA, as the lowest priority. Management actions to increase water availability in high recreational use areas and reduce suppression response times would help reduce the number of acres burned in a fire, stabilizing forage availability in the HMA. Improving water availability for suppression efforts would also complement efforts to increase the reliability of water sources for wild horses. Travel restrictions during high fire danger would reduce opportunity for human-caused fires and decrease disturbance to wild horses.

In Alternative I, temporary fences would protect burned plant communities and allow for uses in pastures with burned plant communities if there are at least 2,000 unburned acres in the pasture. As a result, in a pasture with fewer than 2,000 unburned acres, wild horses would have to be removed from the pasture entirely or be allowed to graze in burned areas. Allowing wild horses to graze in pastures with fewer than 2,000 unburned acres may result in major, long-term impacts to rangeland health and forage availability within the HMA because the burned areas would likely be grazed by wild horses before full recovery occurred. The reduced vigor and production of plants in the HMA would also increase opportunities for invasive plants to occupy the area decreasing long-term availability of forage.

Impacts from Management Specific to Alternative II

Under Alternative II, the wild horse herd would be reduced to zero; therefore, management for wildland fire suppression, fuels, and ES&BAR would have no impact to wild horses.

Impacts from Management Specific to Alternative III

The HMA would not be a critical suppression area, similar to Alternatives I, IV, and V. VMA A would have the second highest priority during multiple fire starts rather than lowest as in Alternative I. Assigning the HMA a higher priority for suppression would increase the stability and availability of forage to wild horses, and decrease the disturbance associated with rehabilitation efforts following wildland fire. Forage availability would be affected less than in Alternative I, as the emphasis on improving water availability would be throughout the planning area and more actions would be implemented to reduce response time for suppression efforts. Travel restrictions would be more expansive than in Alternative I, further reducing the opportunity for human-caused fires and increasing security for wild horses.

Management direction under *Fuels and Emergency Stabilization and Burned Area Rehabilitation* in Chapter 2 would offer a broader range of tools and treatments to limit fire size, spread, and intensity as compared to Alternative I. More fuels treatments within the WUI and more fuel breaks outside the WUI would be implemented, improving the ability to suppress and contain starts to smaller acreages, reducing short- and long-term negative effects to forage availability and decreasing disturbance.

Temporary fences would be allowed to protect burned plant communities. As a result, Alternative III would cause the least disruption to wild horses of the action alternatives due to temporary fence management direction by allowing wild horses to graze in unburned areas while allowing burned areas to recover.

Impacts from Management Specific to Alternative IV

Alternative IV would impact forage available to wild horses and rangeland health within the HMA similarly to Alternative I. However, the emphasis on improving water available for suppression throughout the planning area would improve water availability and distribution of wild horses throughout the HMA.

Fuels and ES&BAR actions would have similar effects on forage stability and disruption as Alternative I, except more acres for fuels reduction treatments, especially acres identified for rehabilitation to FRCC 1, within and outside the WUI would occur, further reducing impacts to wild horses as compared to Alternative I.

Temporary fences would be allowed to protect burned plant communities in Alternative IV, but would not be allowed in pastures with native plant communities or in pastures with fewer than 2,000 unburned acres. Approximately 22% of the HMA consists of native vegetation; however, as areas within the HMA are restored to native vegetation, the areas available for using temporary fences would decrease, increasing the disruption to wild horses. If partially burned pastures contained native plant communities or fewer than 2,000 acres of unburned vegetation, wild horses would have to be removed from the pastures entirely or be allowed to graze in burned areas. Allowing wild horses to graze in partially burned pastures may result in major, long-term impacts to rangeland health and forage availability within the HMA because the burned areas would likely be grazed prior to full recovery. The reduced vigor and production of plants in the HMA would also increase opportunities for invasive plants to occupy the area and decrease long-term availability of forage.

Impacts from Management Specific to Alternative V

Wildland Fire management in Alternative V would impact forage available to wild horses and rangeland health within the HMA similar to Alternative I. Water availability for fire suppression would be maintained at current levels, reducing the effectiveness of measures to reduce fire size and intensity.

Impacts from fuels and ES&BAR management actions on forage stability and disruption to wild horses would be similar to Alternative I, except fewer acres of fuels treatments outside the WUI would be allowed. The emphasis on rehabilitation of burned areas to native communities is similar to Alternative I except only native species would be used in rehabilitation efforts.

Alternative V would not allow installation of temporary fences to protect burned areas. Horses would either be allowed to remain in pastures with burned areas, potentially affecting rate of recovery, or would have to be removed entirely, either by relocating to unburned pastures or allotments or removed from the HMA and placed in short-term holding until burned areas have rehabilitated.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI the HMA would be 100% within a critical suppression area giving this area highest suppression priority and would have appropriate management responses identified to reduce fire size. Being an area of high suppression priority would increase the stability and availability of forage to wild horses, and decrease the disturbance associated with rehabilitation efforts following wildland fire. However, because the Saylor Creek HMA is primarily grassland, it would be a lower priority than critical suppression areas containing sagebrush steppe within the sage-grouse management area.

Forage availability affected by wildland fire would be less than described in Alternative I because the emphasis on improving water available for suppression would be throughout the planning area and more actions would be implemented to reduce response time for suppression efforts. Restrictions on travel and authorized uses would be more expansive than in Alternative I, further reducing the opportunity for human-caused fires and increasing security for wild horses.

Management direction under *Fuels and Emergency Stabilization and Burned Area Rehabilitation* in Chapter 2 would offer a broader range of tools and treatments to limit fire size, spread, and intensity as

compared to Alternative I. More fuels treatments within the WUI and more fuel breaks outside the WUI would be implemented, improving the ability to suppress and contain starts to smaller acreages.

Temporary fences would be allowed to protect burned plant communities in Alternative VI. Disruption to wild horses due to temporary fence construction would be similar to Alternative III and less than all other action alternatives by allowing wild horses to graze in unburned areas while allowing burned areas to recover.

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on wild horses:

- Amount of forage available to wild horses,
- Amount of water available to wild horses, and
- Level of disruption to wild horses in the Herd Management Area (HMA).

The Saylor Creek HMA is comprised of portions of eight livestock grazing allotments. Allotment-specific allocations will be determined during the permit renewal process to address site-specific resource needs (e.g., wild horses, upland vegetation) and maintain the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management which will maintain forage availability in the HMA.

The HMA occupies approximately 6.5% of the planning area. Allocation to wild horses would be less than 0% to 14% of available forage at the planning area scale. However, the allocation of forage to wild horses would range from 0% to 155% relative to livestock within the HMA.

Forage allocation for wild horses was accounted for at the planning level. The majority of livestock exclosures are too small to be practical to make accessible by wild horses, consequently, an indirect effect of making areas unavailable for livestock grazing is the exclusion of wild horses from those areas as well. Fences associated with livestock management can disrupt wild horses by restricting their movement within the HMA. Artificial water sources developed for livestock management are the only water sources available to wild horses in the HMA. Competition between livestock and wild horses for limited resources, particularly water, may create conflicts between domestic livestock and wild horses.

Table 4-217 displays areas available and unavailable for livestock grazing within the HMA.

Table 4-217. Allocation of Forage (Animal Unit Months) and Areas Available and Unavailable for Livestock Grazing in the Saylor Creek Herd Management Area by Alternative (Acres)

Allocations	Alternative						
	No Action	I	II	III	IV	V	VI
Available [A]	95,000	92,000	95,000	95,000	94,000	82,000	95,000
Unavailable [B]	0	3,000	40	200	800	13,000	200
Allocation to Livestock (AUMs) at the planning level [C]	160,000 to 260,000	179,000 to 245,000	362,000 to 440,000	276,000 to 348,000	78,000 to 123,000	42,000 to 85,000	186,000 to 279,000
Allocation to livestock within the HMA (AUMs)[C]	10,000 to 17,000	15,000 to 21,000	33,000 to 40,000	25,000 to 31,000	8,000 to 12,000	4,000 to 7,000	18,000 to 27,000
Allocation to Wild Horses (AUMs)	600	2,400	0	7,200	2,400	6,000	2,400

[A] Acres available to livestock within the HMA are available to wild horses.
[B] The areas unavailable to livestock grazing within the HMA are also unavailable to wild horses because they are small exclosures (except Alternative V which has a pasture sized reference area) that would not be practical or safe to make available to wild horses.

[C] For Alternatives I through VI, AUMs at initial implementation of the plan are an estimate of forage that would be available for livestock based on the vegetation allocation and the areas available for livestock grazing by alternative. The AUMs used in the analysis for Alternatives I through VI are estimates of forage availability within the HMA and are provided to assist the reader in comparing the effects of the alternatives. The number of AUMs available within the planning area may be more or less when project-level analysis of grazing permits is completed but would remain within the range of allocation percentages described.

Impacts from Management Specific to the No Action Alternative

Livestock numbers and management within allotments in the HMA would be in relative balance with the wild horse herd with adequate water and forage available to the wild horse herd.

The entire HMA would be available to livestock grazing in the No Action Alternative. This would cause little, if any, disruption to wild horse movement or access to portions of the HMA.

Impacts from Management Common to All Action Alternatives

Management common to all action alternatives would balance livestock authorizations with other resources and would help maintain or achieve Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management, providing long-term forage stability in the HMA.

Impacts from Management Specific to Alternative I

Forage allocation for livestock grazing is estimated to be between 15,000 and 21,000 AUMs in the HMA and would allow livestock grazing in 97% of the HMA. Forage available to wild horses would not be decreased by this level of allocation to livestock grazing. There may be negligible to minor disruptions to wild horse movement by creating reference areas, Wildlife Tracts, and areas open to cross-country motorized vehicle use inaccessible to wild horses. This would occur in 3% of the HMA; forage would not be available in these areas.

Management actions in Alternative I provide direction for season-of-use, utilization, and installation of infrastructure specific to livestock management that would manage livestock grazing in balance with resource needs (e.g., wild horses, upland vegetation). Direction for the maintenance and alteration of existing infrastructure to achieve resource objectives, including those for wild horses, would provide a moderate, long-term benefit to wild horses by utilizing infrastructure to reduce impacts to rangeland health and reduce disruption to wild horses. Management of range infrastructure would provide sufficient water for wild horse needs.

Impacts from Management Specific to Alternative II

Under Alternative II, the wild horse herd would be reduced to zero. As a result, livestock grazing management under this alternative would not have an effect on the availability of forage and water or disruption of the wild horse herd.

Impacts from Specific to Alternative III

Livestock grazing would be allowed in greater than 99% of the HMA. This would cause little, if any, disruption to wild horse movement or access to portions of the HMA. The forage allocation for Alternative III is estimated to be between 25,000 and 31,000 AUMs for livestock within the HMA. This allocation is the second highest for livestock and the highest for wild horses of all the action alternatives. Allocation of forage to livestock grazing within the eight allotments in the HMA would give priority to resources so availability of forage for wild horses would not be limited.

As horse numbers increase to the upper range of the appropriate management level (AML) more conflicts between livestock grazing permittees and wild horses for limited water sources are anticipated. Increased pressure on water sources due to the wild horse numbers, principally livestock water pipelines and troughs, would necessitate major improvement to some facilities. Improvements may include additional storage, extension of pipelines, and more troughs. To provide sufficient water for the higher number of wild horses in this alternative a complete replacement of the Tuanna Pipeline would be necessary due to its age and poor condition. Additionally, drilling of a new well may be necessary as one of the wells providing water for livestock and wild horses in the HMA is located on private land.

Other management actions would be implemented to maintain and improve native plant diversity and decrease fire size by reducing fuels in non-native perennial communities. Decreasing fire frequency and size would provide major long-term forage stability in the HMA, but increased localized competition between livestock and wild horses for available forage may affect the ability of rangelands in those areas to achieve rangeland health standards.

Impacts from Management Specific to Alternative IV

Under Alternative IV, livestock grazing would be allowed in 99% of the HMA. This would cause little, if any, disruption to wild horse movement or access to portions of the HMA. Sufficient vegetation would be available for wild horse forage needs.

Implementation of Alternative IV would result in a reduced allocation of vegetation to livestock across the planning area compared to all alternatives except Alternative V. Allocation to livestock grazing within the HMA is estimated to be between 8,000 and 12,000 AUMs. Reductions in allocation for livestock would help maintain increase forage available for wild horses within the HMA, but may also result in accumulation of fine fuels, increasing risk of wildland fire starts and increased size and intensity of wildland fire. Competition between wild horses and livestock for available forage and water is expected to be less than all action alternatives other than Alternative II. The decreased livestock allocation would increase the BLM's ability to adjust allotment and pasture boundaries to improve distribution of wild horses throughout the HMA, resulting in improvements to rangeland health and reduced disruption to wild horse movements.

The decreased livestock allocation would also increase the BLM's responsibility for maintaining livestock watering facilities to meet the needs of wild horses. If the amount of forage available to livestock in the HMA decreases substantially, the permittees would no longer need to maintain or provide access to those private water rights within the HMA. In that case, in order to maintain sufficient water availability for wild horses, water rights would need to be secured, and/or new wells drilled on BLM-managed land.

Impacts from Management Specific to Alternative V

Alternative V would have similar impacts to wild horses as Alternative IV, except fewer AUMs (4,000 and 7,000 AUMs) within the HMA would be available to livestock. Decreases in allocation to livestock would not occur evenly across the planning area but would be allotment specific. If decreases occur within the HMA, competition between wild horses and livestock for forage and water would decrease.

Under Alternative V, livestock grazing would be allowed in 84% of the HMA. There would be moderate disruptions to wild horse movement by making reference areas and Wildlife Tracts inaccessible to wild horses; this would also decrease the wild horses' ability to access large portions (16%) of the HMA.

As discussed in Alternative IV, if allocation to livestock grazing was substantially decreased in the HMA, the BLM would have increased responsibilities for maintaining water supply pipelines and obtaining water rights to ensure adequate water for wild horse needs. However, the demand for water by wild horses in this alternative would be higher due to the higher AML in Alternative V. In addition, Alternative V would not allow construction of new pipelines, decreasing the ability to increase distribution of water in the HMA. Limiting opportunities to improve distribution of water and wild horses would have moderate negative effects on the BLM's ability to maintain or improve rangeland health.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, vegetation allocation to livestock grazing is estimated to be between 17,000 and 28,000 AUMs and would allow livestock grazing in 99% of the HMA. Wild horses and wildlife would be given priority so allocation of forage to livestock grazing within the eight allotments in the HMA would not limit forage available to wild horses. There may be negligible to minor disruptions to wild horse movement by making reference areas, Wildlife Tracts, and areas open to cross-country motorized vehicle use unavailable to wild horses; however, less than 1% of the HMA would be affected.

Management actions in Alternative VI are similar to Alternative I and would provide direction for season-of-use, utilization, and installation of infrastructure specific to managing livestock grazing in balance with

resource needs (e.g., wild horses, upland vegetation). Direction for the maintenance and alteration of existing infrastructure to achieve resource objectives, including those for wild horses, would provide a moderate, long-term benefit to wild horses by utilizing infrastructure to reduce impacts to rangeland health and reduce disruption to wild horses. Management regarding range infrastructure would also provide sufficient water for wild horse needs.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions on wild horses:

- Amount of forage available to wild horses and
- Level of disruption to wild horses in the Herd Management Area (HMA).

Human activity within the HMA is commonly associated with roads and trails frequented for motorized recreation, as they provide access to the HMA. The impacts of human activity on wild horses can be both direct (e.g., human harassment of wild horses) and indirect (e.g., wild horses moving from or avoiding areas with high amounts of human activity). During foaling season, human activity can disrupt mares and their foals, reducing their security. Therefore, management that would affect the amount of human access and activity in the HMA would affect the degree to which wild horse movement or behavior would be disrupted.

There is also a strong association between soil disturbance and motorized vehicle use, especially along roads and trails. Disturbance of soils and associated vegetation communities increases the opportunity for accelerated soil erosion and the introduction and spread of noxious weeds and invasive plants. This often results in decreased forage production and increased fire risk, especially if disturbed sites are occupied by annual invasive grasses such as cheatgrass. Therefore, management that would affect the amount of soil disturbance due to motorized vehicles would affect forage availability and rangeland health within the HMA.

The impacts of transportation and travel management on wild horse indicators would be proportional to the miles of roads within the HMA and acres open to cross-country motorized vehicle use. These factors also reflect impacts of recreation on wild horses, since the primary recreational activity occurring within the HMA is motorized recreation. Table 4-218 displays the travel designations prescribed for lands within the HMA.

Table 4-218. Travel Designations in the Saylor Creek Herd Management Area by Alternative (Acres)

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Deadman/Yahoo Travel Management Area	0	16,000	0	18,000	18,000	0	20,000
Open to Cross-Country Motorized Vehicle Use	40,000	2,000	0	2,000	2,000	0	2,000
Limited to Designated Routes	55,000	93,000	95,000	93,000	93,000	95,000	93,000

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 47% of the HMA would continue to be open to cross-country motorized vehicle use. It is expected that the current growth in popularity of recreational uses in areas of the HMA remaining open to cross-country travel and immediately adjacent to the HMA, predominantly motorized recreation, would continue. The most popular seasons for motorized recreational activity are spring and early summer; however, because the winters are generally without snow, riding during fall and early winter is popular as well. Traditionally foaling season occurs in the spring or early summer months. However, breeding periods have been affected in the past by emergency gathers and holding of mares and stallions separately in facilities while burned areas recovered. Separation of mares and stallions has

resulted in some foaling occurring during fall months. Increases in motorized recreation are expected to result in increases in the amount of disruption and stress to the wild horses.

Impacts to forage availability, rangeland health, and disruption to the wild horse herd resulting from this alternative would be moderate in the short term, but would increase in the long term as user-created off-highway vehicle (OHV) play areas expand further into areas remaining open to cross-country travel within the HMA. Additional minor impacts are expected from transportation routes associated with land use authorizations within the HMA.

Impacts from Management Common to All Action Alternatives

Development of a Travel Management Plan (TMP) would create partnerships and provide additional direction to effectively manage access and travel in the HMA. The enactment of the Omnibus Public Lands Management Act of 2009 limits motorized travel to designated routes on approximately 55,000 acres of the HMA; thereby limiting impacts to available forage and disturbance to horses from human activity. Long-term, moderate improvements in rangeland health in the HMA and reduced levels of disruption to the wild horse herd are expected from these management actions.

Impacts from Management Specific to Alternative I

Maintenance of forage production through long-term improvement of rangeland health, as well as reduced levels of disruption and increased security of wild horses, is expected to result from limiting motorized vehicle use to designated routes in 97% of the HMA. Seasonal restrictions on travel in the HMA would also result in less disruption to wild horses during foaling season. Only 2% of the HMA portion of the Deadman Special Recreation Management Area (SRMA) would be open to cross-country motorized vehicle use. However, the Deadman SRMA would not be available to wild horses, resulting in minor negative effects on forage availability and limited disturbance. Wild horses would most likely continue to avoid the SRMA due to high levels of seasonal human activity. Areas within and adjacent to the HMA are expected to continue increasing in popularity for motorized recreational use. Creation of the Deadman/Yahoo Travel Management Area (TMA) between the Deadman and Yahoo SMRAs would limit OHV activity to designated routes and reduce disruption to wild horses compared to the No Action Alternative. However, a portion of the Home Range would have increased OHV activity resulting in avoidance of those areas by wild horses. Rangeland health is expected to decrease in these areas by increasing the amount of bare ground, accelerating soil erosion, decreasing forage production, and increasing risk of human-caused fire, noxious weeds, and invasive plants.

Seasonal closures or restrictions on primitive roads, trails, and open areas would reduce the potential for human-caused fire, thereby reducing the potential for conversion of more desirable vegetation types to less desirable.

Impacts from Management Specific to Alternative II

In Alternative II, the wild horse herd would be reduced to zero and the HMA status would be removed. Actions taken under this alternative are expected to have no impacts to the wild horse herd as implementation of the TMP would follow removal of wild horses from the HMA.

Impacts from Management Specific to Alternative III

Transportation and travel management in Alternative III would be similar to Alternative I except the Deadman/Yahoo TMA would be slightly larger, potentially impacting a larger area of the wild horse Home Range within the HMA. Impacts of routes and human activity in those areas would not decrease as it would in Alternative I.

Impacts from Management Specific to Alternative IV

Transportation and travel management in Alternative IV would be similar to Alternative I, except there would be no seasonal travel restrictions during foaling season. The Deadman/Yahoo TMA is slightly larger than Alternative I, potentially increasing disturbance of wild horses within their home range. Because Alternative IV would manage for a non-reproducing herd, there would be no disruption to mares and their foals.

Impacts from Management Specific to Alternative V

Transportation and travel management in Alternative V would be similar to Alternative I, except no areas would be open to cross-country motorized vehicle use. Not having an open area in and immediately adjacent to the HMA would improve rangeland health and reduce disruption to wild horses. While Alternative V would not include a seasonal travel restriction during foaling season, it would contain a non-reproducing herd resulting in no disruption to mares and their foals.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Long-term improvements in rangeland health and maintenance of forage production, as well as reduced levels of disruption of wild horses are expected to result from limiting motorized vehicle use in 98% of the HMA to designated routes. Areas open to cross-country travel (portion of Deadman SRMA) would be approximately 2% of the HMA. These areas would be available for use by wild horses but the SRMA is expected to be avoided due to high human activity. The Deadman/Yahoo TMA would not overlap areas identified as Home Range within the HMA providing a major improvement in decreasing disturbance of wild horses. Developing a Travel Management Plan for the Deadman/Yahoo TMA would provide additional direction to help mitigate negative effects of human activity by designating routes for recreational use, decreasing negative impacts to rangeland health in the HMA.

Impacts from Land Use Authorizations Actions

The following indicators were used to analyze the impacts of Land Use Authorizations actions on wild horses:

- Amount of forage available to wild horses and
- Level of disruption to wild horses in the HMA.

Management actions for land use authorizations may affect wild horses by increasing human access to the HMA and increasing disruption to wild horses. Construction and maintenance of the authorized project and associated infrastructure may result in displacement of wild horses from portions of the HMA where the activities are occurring.

Table 4-219 displays the acres within the HMA identified for potential utility right-of-way (ROW) corridors and expected wind energy development. None of the alternatives identify ROW exclusion areas in the HMA.

Table 4-219. Potential Land Use Authorizations in the Saylor Creek Herd Management Area (Acres)

Land Use Authorization	Alternative						
	No Action	I	II	III	IV	V	VI
Acres available for ROW Utility Corridors	3,000	2,000	3,000	3,000	3,000	3,000	3,000
Acres Available for Expected Wind Development	94,000	74,000	91,000	76,000	74,000	63,000	87,000
Acres with Expected Wind Development	2,000	1,000	2,000	1,500	1,500	1,500	> 100

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would allow for the consideration of land use authorizations in and adjacent to the HMA (Maps 97 and 99 through 105). Utility ROW corridors cover 3% of the HMA. The majority of the HMA (99%) would be available for wind energy development; however, only approximately 2% of the area has wind potential high enough to expect development.

The intensity and duration of the effects on wild horses would vary depending on mitigation. Potential effects of these land use authorizations would be temporary displacement of wild horses from preferred

grazing areas due to human activity associated with construction and maintenance of the authorization and associated infrastructure (e.g., powerline, road, wind turbine). The intensity and duration of the effects on wild horses would vary depending on mitigation conducted during construction and maintenance of the authorization. The availability of forage would decrease where permanent infrastructure (poles, roads, turbines) would be located through the conversion of vegetation types. Increased human activity would also increase the risk of human-caused fires creating a short-term reduction of forage and increased disturbance due to displacement from burned areas and emergency stabilization and burned area rehabilitation treatments.

Management that focuses new ROWs in disturbance corridors and co-locating new communication sites with existing sites would generally help reduce effects of land use authorizations on forage availability and level of disturbance by limiting areas where ROW could be considered.

Impacts from Management Common to Action Alternatives I, III, IV, V, and VI

Alternatives I, III, IV, V and VI would allow for the consideration of utility ROW corridors in approximately 2% to 3% of the HMA. Wind energy development would be available on approximately 66% to 80% of HMA; however, only 1% to 2% of the area has wind potential high enough that development is expected. Effects of these land use authorizations would be similar to that described for the No Action Alternative.

Impacts from Management Specific to Alternative II

Under this alternative, the wild horse herd would be reduced to zero, resulting in no impacts to the wild horse herd.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would allow for the consideration of utility ROW corridors in approximately 2% to 3% of the HMA. Wind energy development would be available on approximately 92% of HMA; however, only less than 1% of the HMA has wind potential high enough that development is expected. Effects of these land use authorizations would be similar to that described for the No Action Alternative.

Impacts from Leasable Minerals Actions

The following indicators were used to analyze the impacts of Leasable Minerals actions on wild horses:

- Amount of forage available to wild horses and
- Level of disruption to wild horses in the Herd Management Area (HMA).

Within the HMA, 61,000 acres have been identified as having potential for oil and gas leasing. Both short- and long-term effects to wild horses would occur if oil and gas exploration and development were to occur. Short-term effects would occur primarily during exploration and the implementation phase of the project as increased human activity disturbs the wild horses. Exploration activity is expected to be relatively short, over several weeks or months, but intense, requiring 10 to 15 people and five to seven vehicles (Appendix K). Seismic reflection (use of explosives) is the preferred method and would pose the most disturbances to the wild horse herd.

Increased human activity would temporarily displace wild horses from the immediate vicinity of construction; however, wild horses would quickly become acclimated to the new permanent infrastructure and resume utilization of the area. Construction and maintenance of new roads and infrastructure (e.g., pump stations, pipelines) would permanently remove and alter vegetation, affecting long-term forage availability. Development is anticipated to be limited to two wells, approximately 30 acres, during exploration; one well producing oil. Five additional wells would be drilled at the producing well, increasing surface occupancy to a total of 90 acres. Increased route density on approximately 10 acres per well, would increase access and increase human activity and ground disturbance thereby increasing the potential for introduction and spread of noxious weeds and invasive plants and reducing the stability of the forage base.

Each well utilizes 5,000 to 15,000 gallons of water per day, requiring acquisition of water rights. Depending upon the location of and number of oil and supporting water wells, there is potential to affect the water table and production of existing wells supplying water to the wild horse herd.

Within the HMA, 95,000 acres have been identified as having potential for geothermal leasing. Increased human activity would increase disturbance to wild horses but effects would be short-term and associated with project implementation and construction (Appendix L). Surface disturbance due to exploration and development activities is expected to occur on 185 to 230 acres over the life of the plan. Wild horses would become accustomed to the permanent structures, but disturbance from increased human activity would continue with operation and maintenance.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, the portions of the HMA with potential for oil and gas leasing or geothermal leasing would be available for leasing subject to standard lease terms. Based on the Reasonably Foreseeable Development Scenarios (RFDSs) (Appendices K and L), approximately 90 acres of surface disturbance due to oil and gas leasing and 185 to 230 acres of surface disturbance due to geothermal leasing could occur within the HMA, which would affect forage availability and disrupt wild horses in those areas.

Impacts from Management Common to All Action Alternatives

Even though leasable mineral allocations differ in the action alternatives for the planning area as a whole, the allocations within the HMA remain the same. Of the 61,000 acres with potential for oil and gas leasing within the HMA, 61,000 acres within the HMA would be available for oil and gas leasing subject to standard lease terms, and approximately 400 acres would be available for lease with surface restrictions for the Oregon National Historic Trail and Riparian Conservation Areas. Based on the RFDS for oil and gas development (Appendix K), approximately 90 acres of surface disturbance could occur within the HMA, which would affect forage availability and disrupt wild horses in those areas.

Of the 95,000 acres within the HMA with medium potential for geothermal leasing, 95,000 acres would be available for geothermal leasing subject to standard lease terms, fewer than 100 acres would be available with controlled surface use restrictions, and 300 acres would be available with no surface occupancy. Based on the RFDS for geothermal development (Appendix L), 185 to 230 acres of surface disturbance could occur within the HMA, which would affect forage availability and disrupt wild horses in those areas.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

Maintaining the low appropriate management level (AML) of 50 wild horses, the No Action Alternative would make maintaining the genetic diversity of the wild horse herd the most difficult of any of the alternatives. Because the number of reproducing animals in a herd of this size would be limited, periodic testing of genetic viability would be required and, if necessary, new genetic material introduced to the herd (Coates-Markle, 2000). Impacts to wild horses would be adverse, but minor.

Of all the alternatives, the fewest actions would be taken to convert annual grasslands to perennial vegetation in the No Action Alternative, resulting in the least amount of improvement of forage availability and stability in the Herd Management Area (HMA). Rangeland health in the HMA would likely experience the least negative impacts of all alternatives, except Alternative II, primarily due to the low wild horse numbers. Water availability in the No Action Alternative would continue to be the limiting resource for wild horses.

This alternative would be the least favorable for reducing disruption to wild horses due to the expected increase in human activity, primarily motorized recreation use and land use authorizations. Retention of areas open to cross-country motorized vehicle use would exacerbate human-wild horse conflicts, particularly during the foaling period.

Impacts from Alternative I

Overall, Alternative I would impact wild horses less than the No Action Alternative and Alternative V, but more than Alternatives III and IV. The AML established in this alternative, 100 to 200 reproducing wild horses, is expected to a minor adverse impact to genetic diversity of the herd. With the AML two to four times higher than in the No Action Alternative, maintaining genetic diversity would be easier, but more difficult than in Alternative III, which has a higher AML. Periodic testing of genetic viability would be required and, if necessary, new genetic material (i.e., young mares from other HMAs) introduced to the herd. Impacts to wild horses would be adverse, but minor.

This alternative would improve stability of forage available for wild horses through fuels management and conversion of plant communities to a higher proportion of perennials. The overall improvement in forage availability would be minor and beneficial, similar to Alternatives III, IV, and VI. Rangeland health in the HMA would be likely to improve, due to relatively low wild horse numbers as well as vegetation management, resulting in minor beneficial impacts. Water availability for wild horses would improve to a similar degree as in Alternatives IV and VI, although not as much as in Alternative III.

Alternative I would reduce disruption to wild horse movements and behavior more than in the No Action Alternative and Alternative III, but less than Alternatives IV, V, and VI. Sources of disruption would include human activity associated with roads and recreation, vegetation treatments, restrictions by temporary fencing following fire, and the amount of the HMA unavailable for livestock grazing; however, because most disruption is due to human activity, transportation and travel management would decrease the overall level of disruption to wild horses.

Impacts from Alternative II

Reducing the wild horse herd to zero would have major negative impacts on wild horses during the process of gathering and relocating wild horses but would be limited to the one gather associated with removing wild horses from the HMA. Forage and water availability for wild horses would no longer be an issue, nor would disturbance of wild horses. Conflicts between wild horses and resource uses, including livestock grazing and motorized recreation, would be eliminated. In the long term, the HMA would experience moderate beneficial impacts to vegetation and soils following the removal of the horses.

Impacts from Alternative III

Overall, Alternative III would impact wild horses less than all alternatives except Alternative IV.

Maintaining a reproducing herd at an AML of 200 to 600 wild horses would provide moderate beneficial impacts as the alternative has the most opportunity to maintain the genetic diversity of the wild horse herd.

Overall, impacts of the AML on rangeland health would second highest of all alternatives. The moderate adverse impacts to rangeland health from the higher AML would be similar to Alternative V; however, vegetation treatments in the HMA would mitigate those impacts to a degree. Effects due to wild horse grazing would be most evident when wild horse numbers approach the upper range of the AML. Additional management actions to improve distribution and some seasonal control of wild horse grazing throughout the HMA would have to be considered in order to achieve resource objectives.

Forage availability and security would improve due to wildland fire management and vegetation treatments, resulting in moderate beneficial impacts. Improvements to water systems to increase reliability and supply of water would accommodate the increases in wild horse allocations.

Conflicts between livestock grazing, motorized recreation and wild horses are expected to remain high relative to Alternatives I through VI, except Alternative II which would not be populated. Conflicts with motorized recreation would decrease compared to the No Action Alternative. Overall, levels of disruption to wild horses would decrease due to the least amount of vegetation treatments in Vegetation Management Area A of the action alternatives, and improved access of the HMA to wild horses through removal or realignment of fences to facilitate wild horse movement.

Impacts from Alternative IV

Overall, Alternative IV would impact wild horse genetic diversity less than any other alternative because the herd of 100 to 200 wild horses would be managed as a non-reproducing herd.

Changes in rangeland health within the HMA would be similar to Alternatives I and VI, due to the comparatively low wild horse numbers and the large areas converted from annual and non-native perennial grasslands to native shrublands. These impacts would be minor to moderate and beneficial.

Forage availability would improve due to wildland fire management and vegetation treatments, resulting in minor to moderate beneficial impacts. Reductions in livestock allocations in this alternative may create a conflict in water rights acquisition and the water supply in one major pipeline that supplies water for wild horses in the HMA that would be less likely to occur in the No Action Alternative and Alternatives I, II, III, and VI. The BLM's responsibility for maintenance and operation of the water systems would increase similar to Alternative V.

Levels of disruption to wild horses would be similar to Alternative V and would be lowest of all the alternatives, primarily due to reductions in human activity from management for transportation and travel and land use authorizations. A non-re-producing herd would eliminate the need to control wild horse populations due to natural reproduction and future impacts from gathers would not occur. The realignment of fences to facilitate wild horse movement and relatively low numbers of livestock would also contribute to lower levels of disruption.

Impacts from Alternative V

Overall, Alternative V would have the most impact on wild horses of all the alternatives. There would be no impacts on the genetic diversity of the herd as the 200 to 500 wild horses would be managed as a non-reproducing herd.

The effects of wild horse grazing on rangeland health and forage availability would be moderate and adverse and the greatest of all alternatives. Increased numbers and limited ability to control grazing effects by the wild horses would expand and intensify the areas of heavy grazing and soil disturbance near water, loafing, and favored grazing areas. Alternative V would also have fewer vegetation treatments to increase the amount of perennial vegetation as compared to Alternatives I, II, III, IV, and VI. Reduction in forage allocated to livestock would mitigate some effects of wild horses by decreasing livestock-related effects to soils and vegetation. However, the inability to control wild horse grazing use (season of use, utilization levels) would limit the benefits of mitigating actions. Decreased livestock allocation would increase flexibility in restructuring allotment and pasture boundaries to improve distribution of wild horses throughout the HMA. Decreased livestock allocation would also increase BLM responsibility for monitoring and maintenance of the water systems.

Reductions in livestock allocations in this alternative has the highest potential to create conflicts in water rights acquisition and the water supply of one major pipeline that supplies water for wild horses in the HMA. Reductions in livestock allocation would also increase the responsibility of the BLM's daily management and operation of water supply systems more than any other alternative. Management prohibiting new pipelines would limit opportunities to use water to improve distribution of wild horses throughout the HMA or relocate existing infrastructure due to resource concerns.

Levels of disruptions to wild horses from human activity would be the lowest of all the alternatives, primarily due to reductions in human activity from management for transportation and travel and land use authorizations. A non-re-producing herd would eliminate the need to control wild horse populations due to natural reproduction and future impacts from gathers would not occur. Fourteen percent of the HMA would be inaccessible to wild horses as an indirect impact of making those areas unavailable for livestock grazing.

Impacts from Alternative VI (Proposed RMP)

Overall, Alternative VI would impact wild horses similar to Alternative IV.

This alternative would improve stability of forage available for wild horses through fuels management and conversion of plant communities to a higher proportion of perennials. The overall improvement in forage availability would be minor and beneficial, similar to Alternatives I, III, and IV. Rangeland health in the HMA would be likely to improve, due to relatively low wild horse numbers as well as vegetation management, resulting in minor beneficial impacts. Water availability for wild horses would improve to a similar degree as in Alternatives I and IV, although not as much as in Alternative III.

Alternative VI would reduce disruption to wild horse movements and behavior similar to Alternative I, more than in the No Action Alternative and Alternative III, but less than Alternatives IV and V. Sources of disruption would include human activity associated with roads and recreation, vegetation treatments, and restrictions by temporary fencing following fire; however, because most disruption is due to human activity, the overall level of disruption to wild horses would decrease due to transportation and travel management.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Because the Saylor Creek Herd Management Area (HMA) is geographically isolated from other HMAs in Idaho and northern Nevada, there is no migration of wild horses between Saylor Creek and any other HMAs. Therefore, impacts related to wild horse management actions would only affect wild horses within the Saylor Creek HMA.

Management actions for land use authorizations may affect wild horses by increased human activity in and around the HMA and increasing disruption to wild horses during construction and maintenance, loss of available forage through conversion of vegetation, and introduction of invasive plants. The cumulative impact analysis area related to Land Use Authorizations would be considered within a five mile radius of the HMA boundary.

Past, present, and reasonably foreseeable actions for the following resource and resource use cumulatively affect wild horses:

- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter.

Approximately 13 small wind energy projects have been constructed on private land in the Bell Rapids, Cassia Gulch, Yahoo and Magic Waters areas south and west of Hagerman. To date approximately 110 wind turbines have been installed. These projects include rights-of-way for related infrastructure (roads and transmission lines) where they cross public land.

Several land use authorizations have been proposed adjacent to the HMA. Four small wind energy projects have been proposed in the northern part of the planning area west of Hagerman. All of the projects would be on private lands except for three to four turbines on BLM (not in the HMA). Currently, the majority of private land is being farmed, and the remaining is rangelands.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

The No Action Alternative contains the highest levels of disruption to wild horse movement and behavior due to the least amount of avoidance areas for land use authorizations in and adjacent to the Herd Management Area (HMA). It is reasonably foreseeable that future interest in wind energy development would continue to increase on BLM-managed, State, and private lands within and adjacent to the HMA. Military avoidance areas and Visual Resource Management (VRM) criteria would limit the potential for wind energy development to the eastern most portions of the HMA. Development of State and private lands in this area would have local, major, short-term negative effects because these areas are within the favored Home Range of the wild horses.

Human activity during construction would be expected to cause short-term disruption to wild horse movement and behavior; long-term negative effects to forage availability would likely result from increased risk of invasive plants and human-caused fire. BLM-managed, State, and private land adjacent to the HMA have potential for wind energy development but disruption of wild horses from human activity would not be expected to be as high because development sites would not be within the HMA. However, disruption and availability of forage would be affected by introduction of invasive plants and human-caused fire at project sites and their expansion into the HMA.

The proposed Gateway West Transmission Line has one alternative proposing placement of the line within the HMA. As a result, activities associated with construction and maintenance of the Gateway West Transmission Line would increase the level of disruption over the short term during project implementation. Long-term risks to forage availability would increase due to introduction of invasive plants and permanent conversion of vegetation in areas infrastructure is placed.

Cumulative Impacts from Alternative I

Interest in wind energy development would continue to increase on BLM-managed, State, and private lands within and adjacent to the HMA. Military avoidance areas and VRM criteria would limit the potential for wind energy development to the eastern most portions of the HMA. Development in this area would have local, major, short-term negative effects because areas with highest potential for development are within favored Home Range of the wild horses.

Human activity during construction would be expected to cause short-term disruption to wild horse movement and behavior. Long-term negative effects to forage availability would likely result from increased risk of invasive plants and human-caused fire. BLM-managed, State, and private land adjacent to the HMA have potential for wind energy development. Disruption of wild horses from human activity would not be expected to be as high because development sites would not be within the HMA. However, disruption and availability of forage would be affected by introduction of invasive plants and human-caused fire at project sites and their expansion into the HMA.

The proposed Gateway West Transmission Line has one alternative proposing placement of the line within the HMA. Activities associated with construction and maintenance of the Gateway West Transmission Line would increase the level of disruption over the short term during project implementation. Long-term risks to forage availability would increase due to introduction of invasive plants and permanent conversion of vegetation due to infrastructure.

Cumulative Impacts from Alternative II

Removal of all the wild horses from the HMA would occur in one gather to minimize costs. Presumably, wild horses would be removed prior to construction of the Gateway West Transmission Line; as a result, there would be no cumulative effects associated with the construction and maintenance of that project or other human activity.

Cumulative Impacts from Alternative III

Cumulative impacts from Land Use Authorizations related to energy development would be similar to those described for Alternative I due to avoidance areas and VRM criteria being essentially the same.

Cumulative Impacts from Alternative IV

Cumulative impacts from Land Use Authorizations related to energy development would be similar to those described for Alternative I due to avoidance areas and VRM criteria being essentially the same.

Cumulative Impacts from Alternative V

Cumulative impacts from Land Use Authorizations related to energy development would be similar to those described for Alternative I due to avoidance areas and VRM criteria being essentially the same.

Cumulative Impacts from Alternative VI (Proposed RMP)

Cumulative impacts from Land Use Authorizations related to energy development would be similar to those described for Alternative I due to avoidance areas and VRM criteria being essentially the same.

4.3.11. Paleontological Resources

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to paleontological resources:

- **The physical integrity of paleontological resources –** Integrity refers not only to the condition of individual fossils but also to the relationship between fossils and their stratigraphic context (i.e., their association with the geologic layer in which they became fossilized). Fossil integrity is important for the accurate taxonomic classification of individual specimens, including identification of the genus or species represented, while contextual integrity is critical for proper age assessments of fossil localities. Physical disturbance that results in destruction of fossils or removal from their stratigraphic context diminishes or destroys the scientific, educational, and recreational value of paleontological resources.

Methods and Assumptions

Impacts to paleontological resources from management in the following sections of Chapter 2 were analyzed in detail: *Paleontological Resources*, *Transportation and Travel*, *Land Use Authorizations*, *Land Tenure*, *Minerals*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for paleontological resources. Impacts from management for paleontological resources are found under *Impacts from Paleontological Resources Actions* in the *Land Use Authorizations*, *Leasable Minerals*, and *Locatable Minerals* sections.

In order to assess impacts to the physical integrity of paleontological resources, it is necessary to identify the areas where fossils are known or expected to occur. For this analysis, the Potential Fossil Yield Classification (PFYC) system, as described in Chapter 3, was used to predict the distribution and density of paleontological resources. Geologic formations were assigned to a PFYC class based on research conducted in southern Idaho between 1870 and 2006 by researchers from the Idaho Museum of Natural History, the University of Michigan Museum of Paleontology, the University of California Museum of Paleontology, the Smithsonian National Museum, the US Geological Survey (USGS), the National Park Service, and the BLM (Winterfeld and Rapp, 2009). A spatial representation of the PFYC classes was produced in a geographic information system by correlating the named fossil-bearing formations identified in the above study with the digital version of the Geologic Map of Idaho produced by the USGS (Johnson and Raines, 1996) from the original paper map created by the Idaho Department of Lands, Bureau of Mines and Geology (Bond et al., 1978). Although the base map was produced at a larger scale (1:500,000) than most of our spatial data, it is currently the best available source of mapped surface geology for the planning area and is adequate for landscape-scale analyses. Finally, the PFYC spatial dataset was compared to the digital footprints of the use allocations and management actions in Chapter 2 that may impact fossil resources.

The following assumptions were used when analyzing impacts to paleontological resources:

- The PFYC system adequately represents the known and expected occurrence of fossil resources in the planning area and can be compared to proposed management decisions to produce a quantifiable assessment of probable effects at the landscape scale.
- The potential for impacts to paleontological resources would be proportional to the acres of land in each PFYC class that overlap areas affected by surface-disturbing management actions or use allocations.
- Paleontological resources are rare and irreplaceable. Impacts to paleontological resources from surface and subsurface disturbance are long term.
- Surface-disturbing uses in PFYC Class 1 and Class 2 units would have low to very low potential to impact the integrity of important paleontological resources.

- Surface-disturbing uses in Class 3 units would have low potential to impact the integrity of important paleontological resources due to the low number of localities known or expected.
- As noted in Chapter 3, no Class 4 units have been identified in the planning area.
- Surface-disturbing uses in Class 5 units would have the greatest potential to impact the integrity of important paleontological resources and could result in increased costs to project proponents and the BLM for impact assessment and mitigation. For these reasons, the analysis of impacts to paleontological resources will focus on the Class 5 units. Approximately 121,000 acres in the planning area are assigned to PFYC Class 5.

Direct and Indirect Impacts

Impacts from Paleontological Resource Actions

Impacts from Management Specific to the No Action Alternative

Management actions under the No Action Alternative would ensure that known paleontological localities would continue to be protected, maintained, or enhanced for their scientific and educational values. The plan specifically identifies the Sand Point Paleontologic Site, and sites within Pasadena Valley, Rosevear Gulch, Dove Springs, Deer Gulch, Pilgrim Spring, and the Glenns Ferry area for protection. These actions would help maintain the physical integrity of paleontological resources at known sites.

Impacts from Management Common to All Action Alternatives

Management actions provide both general direction and specific measures to manage paleontological resources for their scientific and educational values. Compared to the No Action Alternative, the action alternatives take a more proactive approach to paleontological resource management by focusing attention on fossil-bearing geologic formations rather than concentrating only on known localities and by emphasizing a variety of physical, administrative, and educational measures to protect the resource. This approach is systematic and should reduce impacts to the integrity of important fossil resources.

Impacts from Management Specific to Alternative I

This alternative would provide the highest level of emphasis for paleontological resources by combining standard reactive management actions with enhanced proactive inventory, monitoring, and research. Impacts to the physical integrity of paleontological resources from authorized and unauthorized activities are expected to decrease in relation to the No Action Alternative.

Impacts from Management Specific to Alternatives II, III, and VI (Proposed RMP)

Paleontological research would be permitted for specific development projects or when proposed by qualified paleontologists for academic studies. Alternatives II, III, and VI would continue to promote management of paleontological resources but would place a greater emphasis on reactive management compared to Alternative I. Impacts to the physical integrity of paleontological resources from authorized and unauthorized activities are expected to decrease in relation to the No Action Alternative.

Impacts from Management Specific to Alternatives IV and V

Impacts to paleontological resources under these alternatives would be very similar to Alternatives II, III, and VI. Research may be restricted to avoid conflicts with restoration projects but, in most cases, adjustments in research designs could be made to ensure compatibility with upland vegetation restoration objectives. Impacts to the physical integrity of paleontological resources from authorized and unauthorized activities are expected to decrease in relation to the No Action Alternative.

Impacts from Transportation and Travel Actions

Fossils and fossil localities may be affected both directly and indirectly by travel-related activities. Cross-country motorized vehicle use, in particular, is known to impact soils through compaction, vegetation removal, and accelerated erosion (Ouren et al., 2007; Sampson, 2007). When surface soils contain fossils, or provide a protective matrix around fossil deposits, vehicle use can damage or destroy the fossil resources through direct impact or cause their displacement and accelerated weathering due to exposure. Most documented fossil localities occur on steep hillside exposures of the Glenns Ferry

Formation, a Potential Fossil Yield Classification (PFYC) Class 5 unit located in the northern portion of the planning area. Several of these same hillsides have become popular off highway vehicle play areas.

The variables used to evaluate the effects of transportation and travel management on paleontological resources are: the overlap between PFYC Class 5 units and areas open to cross-country motorized vehicle use, closed to motorized vehicle use, and limited to designated routes; and areas of projected route density increases or decreases, as identified in Travel Management Area (TMA) objectives. Open areas, characterized by unrestricted motorized travel, would have the highest potential for impacts to the integrity of paleontological resources. Closed areas, assuming compliance and enforcement, would have a very low potential for motorized vehicle effects, while the use of designated routes is expected to have a low to moderate potential for travel-related impacts, depending on whether route density decreases or increases. Table 4-220 displays travel designations and acres where route density changes are expected to occur within PFYC Class 5 areas.

Table 4-220. Travel Designations and Route Density Changes in Potential Fossil Yield Classification Class 5 Areas by Alternative (Acres)

Transportation and Travel Management Actions	Alternative						
	No Action	I	II	III	IV	V	VI
Travel Designations							
Open to Cross-country Motorized Vehicle Use	59,000	300	0	300	300	300	300
Closed to Motorized Vehicle Use	20	20	20	20	20	20	20
Motorized Use Limited to Designated Routes	62,000	121,000	121,000	121,000	121,000	121,000	121,000
Route Density Change from TMA Focus							
Expected Route Density Increase	NA	17,000	121,000	15,000	15,000	2,000	14,000
Expected Route Density Decrease	NA	105,000	0	0	107,000	120,000	0
No Expected Route Density Change	NA	0	800	107,000	0	0	108,000

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, over 48% of PFYC Class 5 lands would remain open to cross-country motorized vehicle use while less than 1% would be closed to motorized vehicle use and over 51% would be limited to designated routes. Direct and indirect impacts to fossils and fossil bearing sediments from unrestricted motorized travel are expected to decrease the physical integrity of paleontological resources. This alternative offers less protection to paleontological resources from transportation and travel-related impacts than any of the action alternatives.

TMAs are not identified in the No Action Alternative.

Impacts from Management Specific to Alternative I

Under this alternative, 300 acres of PFYC Class 5 lands would be open to cross-country motorized vehicle use; fewer than 100 acres would be closed to motorized vehicle use; and 121,000, over 99%, would be limited to designated routes. Direct and indirect impacts to the integrity of fossils and fossil bearing sediments from unrestricted motorized travel would still occur but on a much reduced scale compared to the No Action Alternative.

Alternative I would create five TMAs; three TMAs would overlap PFYC Class 5 lands. In the Snake River TMA, which includes approximately 85% of the Class 5 lands, route density is expected to decrease. An additional 14% of Class 5 lands fall within the Deadman/Yahoo TMA, where route density is expected to

increase. The remaining 1% of Class 5 land is within the Canyonlands TMA, where route density is expected to decrease.

Impacts from Management Specific to Alternative II

Under Alternative II, no areas would be open to cross-country motorized vehicle use. As with Alternative I, fewer than 100 acres of PFYC Class 5 lands would be closed to motorized vehicle use, and the remaining 99% would be limited to designated routes. Direct and indirect impacts to the integrity of fossils and fossil bearing sediments from unrestricted motorized travel would be lowest under Alternative II.

Alternative II would create two TMAs. Approximately 99% of the PFYC Class 5 lands in the planning area would be in the Bruneau Desert TMA under this alternative. Route density in this TMA is expected to increase. The remaining Class 5 lands would be in the Canyonlands TMA where route density is expected to remain static.

Impacts from Management Specific to Alternative III

Impacts to the integrity of paleontological resources from travel designations would be identical to Alternative I.

Alternative III would create five TMAs; three would overlap PFYC Class 5 lands. The Snake River TMA would include approximately 86% of the PFYC Class 5 lands; travel route density is expected to remain static. An additional 12% of Class 5 lands would fall within the Deadman/Yahoo TMA where route density is expected to increase. The remaining 2% of Class 5 lands would be included in the West Side TMA where route density is expected to remain the same.

Impacts from Management Specific to Alternative IV

Impacts to the integrity of paleontological resources from travel designations would be identical to Alternative I.

Alternative IV would create five TMAs; three would overlap PFYC lands. The Snake River TMA would include approximately 87% of the PFYC Class 5 lands; travel route density in this TMA is expected to decrease. An additional 12% of Class 5 lands would fall in the Deadman/Yahoo TMA where route density is expected to increase. The remaining 1% of Class 5 land would be included in the Canyonlands TMA where route density is expected to decrease.

Impacts from Management Specific to Alternative V

Impacts to the integrity of paleontological resources would be identical to Alternative I.

Alternative V would create five TMAs; three would overlap PFYC lands. The Snake River TMA would include 97% of PFYC Class 5 lands. Route density in this TMA is expected to decrease. The West Side TMA and the Yahoo TMA would split the remaining 3% of the Class 5 lands. Route density is expected to decrease in the West Side TMA and to increase in the Yahoo TMA.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Impacts to the integrity of paleontological resources would be identical to Alternative I.

Alternative VI would create five TMAs; three would overlap PFYC lands. The Snake River TMA would include approximately 89% of the Class 5 lands; travel route density is expected to remain static. An additional 11% of PFYC Class 5 lands would fall within the Deadman/Yahoo TMA where route density is expected to increase. Less than 1% of Class 5 land would be included in the Canyonlands TMA where route density is expected to remain the same.

Impacts from Land Use Authorizations

Land use authorizations are subject to assessment of potential impacts to paleontological resources prior to authorization. Pre-authorization investigations normally rely on surface observations of proposed construction areas. However, some large-scale projects typically disturb both surface and subsurface sediments. Major transmission lines, buried gas pipelines, road construction, and wind energy

developments, in particular, require substantial subsurface excavations that may impact buried fossil deposits. Each alternative identifies areas where utility and wind energy developments are expected to occur and right-of-way (ROW) exclusion areas where development would not be authorized. For this analysis, each of these land use allocations is compared to Potential Fossil Yield Classification (PFYC) Class 5 lands, by alternative, to quantify levels of potential impacts. Table 4-221 displays the acres where land use authorizations may impact paleontological resources.

Table 4-221. Land Use Authorization Allocations in Potential Fossil Yield Classification Class 5 Areas (Acres)

Land Use Authorization Restriction and Development in PFYC Class 5 Areas	Alternative						
	No Action	I	II	III	IV	V	VI
Utility Avoidance Zone [A]	2,000	NA	NA	NA	NA	NA	NA
ROW Exclusion Area	NA	500	100	500	500	500	500
Expected Utility Development Area	10,000	10,000	10,000	10,000	10,000	10,000	15,000
Expected Wind Energy Development Area	18,000	13,000	18,000	13,000	13,000	13,000	11,000

[A] This term applies only to the No Action Alternative.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative includes approximately 2% of the PFYC Class 5 lands, including the Sand Point Area of Critical Environmental Concern (ACEC), in a utility avoidance zone. Management of this zone mixes various levels of restriction and, although not directly comparable, resembles a combination of the ROW avoidance and ROW exclusion areas identified in the action alternatives. The acres identified for this zone represent areas where ROWs would not be authorized. Approximately 8% of Class 5 lands would overlap with the expected utility development areas, and approximately 15% of Class 5 lands would overlap with the expected wind energy development area. Although more acres are excluded from ROW development, the No Action Alternative also has the most Class 5 lands in the expected wind energy development area. Impacts to the integrity of paleontological resources specific to the construction of power transmission lines and wind energy facilities would be similar to Alternative II, but more than under Alternatives I, III, IV, V, and VI.

Impacts from Management Specific to Alternatives I, III, IV, and V

Under Alternatives I, III, IV, and V, less than 1% of PFYC Class 5 lands, including the Sand Point ACEC, would be in the exclusion area for ROWs. Approximately 8% of Class 5 lands would overlap with the expected utility development areas, and approximately 11% of Class 5 lands would overlap with the expected wind energy development area. Impacts to the integrity of paleontological resources due to ROW-related construction would decrease slightly in relation to the No Action Alternative.

Impacts from Management Specific to Alternative II

Under Alternative II, the least amount of PFYC Class 5 lands, less than 1%, would be in the exclusion area for ROWs. The overlap of Class 5 lands with the expected utility development areas would be the same as Alternative I. As with the No Action Alternative, approximately 15% of Class 5 lands would overlap with the expected wind energy development area. Impacts to the integrity of paleontological resources due to ROW-related construction would increase slightly in relation to the other alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The overlap of PFYC Class 5 lands with the exclusion area for ROWs would be the same as Alternative I. Approximately 12% of Class 5 lands would overlap with the utility development areas. Approximately 9% of the Class 5 lands, least of all the alternatives, would overlap with the expected wind energy development area. Impacts to the integrity of paleontological resources due to ROW-related construction would be slightly reduced in relation to The No Action Alternative and Alternative II but would increase slightly in relation to the other alternatives.

Impacts from Land Tenure Actions

Fossil resources are considered part of the surface estate (BLM Manual 8720) and belong to the surface land owner. When lands containing fossil deposits leave Federal ownership, through sale or exchange, any protections afforded fossils by Federal laws and regulations are dissolved. The action alternatives divide the planning area into Land Tenure Zones that determine the types of transactions available for land tenure adjustments. Zone 1 lands would be retained, Zone 2 lands could be disposed of through exchange or Recreation and Public Purposes Act of 1954 (R&PP) patent, and Zone 3 lands could be disposed of through sale, exchange, or R&PP patent. The No Action Alternative uses a similar scheme to identify specific lands for potential disposal. In terms of impacts, the No Action Alternative Zones T1 (sale), T2 (sale or exchange) and T4 (available for agricultural disposal) are equivalent to Zone 3 in the action alternatives; the No Action Alternative Zone T3 (exchange only) is equivalent to Zone 2 in the action alternatives.

For this analysis, land tenure allocations were compared to lands with the highest potential for paleontological resources as identified in the Potential Fossil Yield Classification (PFYC) system. Alternatives which make the most PFYC Class 5 lands available for disposal have the greatest potential to adversely impact the integrity of paleontological resources. Table 4-222 displays the acres within each land tenure zone that overlaps with Class 5 areas. There are 121,000 acres of PFYC Class 5 lands within the planning area.

Table 4-222. Land Tenure Zones for Potential Fossil Yield Classification Class 5 Areas by Alternative (Acres)

Land Tenure Allocation	Alternative						
	No Action	I	II	III	IV	V	VI
Land Tenure Zone 1[A]	92,000	97,000	87,000	97,000	98,000	98,000	111,000
Land Tenure Zone 2[B]	< 100	22,000	25,000	22,000	20,000	23,000	8,000
Land Tenure Zone 3[C]	29,000	2,000	9,000	2,000	3,000	0	2,000

[A] Includes No Action Alternative retention lands.
[B] Includes No Action Alternative Zone T3.
[C] Includes No Action Alternative Zones T1, T2, and T4.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative allocates less than 1% of PFYC Class 5 lands to Land Tenure Zone T1 (sale only) and 24% to T4 (agricultural disposal). T4 lands containing surface exposures of important paleontological resources would be found unsuitable for disposal. No PFYC Class 5 lands are included in zone T2 (sale or exchange) and less than 100 acres are included in T3 (exchange only). Lands in these zones would be available for transfer out of Federal ownership. All other lands would be retained. The No Action Alternative would make more PFYC Class 5 lands available for disposal than any of the alternatives except Alternative II. Disposal removes the legal and regulatory protections afforded Federally owned resources and indirectly threatens the integrity of paleontological resources.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Criteria for consideration when contemplating sales of public land are identified under Land Tenure in Chapter 2. Although not specifically mentioned, paleontological resources would be one of the public land values to be weighed against the public benefits that could accrue from a particular sale.

Impacts from Management Common to All Action Alternatives

The management actions common to all action alternatives provide general direction for land tenure transactions. Allocations and actions that could benefit paleontological resources include closing the planning area to new Desert Land Entry Act and/or Carey Act applications and making known paleontological localities a priority for acquisition. These actions would reduce threats to the integrity of paleontological resources from agricultural disposal and increase protection for the resource in relation to the No Action Alternative.

Impacts from Management Specific to Alternatives I and III

Alternatives I and III would place approximately 80% of PFYC Class 5 lands within Land Tenure Zone 1, approximately 18% in Zone 2, and the remaining 2% in Zone 3. As stated above, Zone 1 provides the most protection for paleontological resources against loss through sale or exchange. Impacts to the integrity of paleontological resources from land disposals would be reduced in relation to the No Action Alternative and Alternative II, increased compared to Alternative VI, and similar to Alternatives IV and V.

Impacts from Management Specific to Alternative II

Under Alternative II, approximately 72% of PFYC Class 5 lands would fall into Zone 1 while 21% would be in Zone 2 and 7% in Zone 3. This alternative allocates the most Class 5 acres for potential disposal, therefore, impacts to the integrity of paleontological resources from land disposals would be expected to increase in relation to all other alternatives.

Impacts from Management Specific to Alternative IV

Under Alternative IV, just over 80% of PFYC Class 5 lands would fall into Zone 1 while 17% would be in Zone 2 and just under 3% in Zone 3. Impacts to the integrity of paleontological resources from land disposals would decrease in relation to the No Action Alternative, increase in relation to Alternative VI, and would be similar to Alternatives I, III, and V.

Impacts from Management Specific to Alternative V

Alternative V would place just over 80% of PFYC Class 5 lands within Land Tenure Zone 1, just under 20% in Zone 2, and no acres in Zone 3. Impacts to the integrity of paleontological resources from land disposals would decrease in relation to the No Action Alternative and Alternative II, increase in relation to Alternative VI, but would be similar to Alternatives I, III, and IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would place 92% of PFYC Class 5 lands within Land Tenure Zone 1, 7% in Zone 2, and just under 2% in Zone 3. This alternative would manage the most acres of PFYC Class 5 lands for retention and would have the least potential for impact from land disposal actions on the integrity of paleontological resources.

Impacts from Minerals Actions

The development of leasable, salable, and locatable minerals has the potential to impact the integrity of paleontological resources through both surface and subsurface disturbance related to extraction activities and associated infrastructure. Mineral extraction may require earth moving, tunneling, blasting, drilling, road construction, or other earth-disturbing actions, all of which could damage or destroy fossil resources.

Leasable minerals include energy resources such as oil, gas, and geothermal waters. The Reasonably Foreseeable Development Scenario (RFDS) for oil and gas development potential indicates an area of approximately 307,000 acres in the planning area has potential for oil and gas leasing. Approximately 91,000 of those acres are classified as Potential Fossil Yield Classification (PFYC) Class 5. The RFDS assumes that 10 to 20 leases may be offered over the next 20 years, resulting in two to three geophysical exploration programs and one to two exploration wells. Total surface disturbance associated with oil and gas development is estimated at 90 acres (Appendix K).

Geothermal resources may also be present beneath PFYC Class 5 units on the Snake River Plain in the northern portion of the planning area. Approximately 9,000 acres have a high potential for geothermal leasing and another 357,000 acres have medium potential for leasing. These areas include all 121,000 acres of PFYC Class 5 lands in the planning area. Geothermal extraction would require the drilling of deep wells and the construction of power plants to convert the geothermal steam to electricity. New roads and powerlines may also be required. Total surface disturbance associated with geothermal development is estimated at 185 to 230 acres (Appendix L).

With the current focus on developing new sources of domestic energy, future oil and gas and geothermal developments in the planning area are possibilities. For this analysis the potential oil and gas and geothermal development areas and the areas closed to leasable mineral development for each

alternative are compared to the PFYC Class 5 areas. Alternatives with the most Class 5 lands open to development would have the greatest potential to impact the integrity of paleontological resources while those with the most Class 5 areas closed to mineral leasing would offer the most protection for paleontological resources.

Salable minerals include sand, gravel, and decorative stone. Sand and gravel pits are common in the fossiliferous northern portion of the planning area. The extraction of sand and gravel requires surface and subsurface disturbance and is a common source of impact to, and discovery of, paleontological localities (Winterfeld and Rapp, 2009). To evaluate the potential effects of salable mineral management allocations and actions, the areas available and closed to salable minerals in each alternative were compared to the PFYC Class 5 lands. Alternatives with the most Class 5 acres open to salable mineral development have the greatest potential to impact the integrity of paleontological resources while those with the most Class 5 acres closed to mineral sales would offer the most protection for paleontological resources.

Locatable minerals include gold, silver, other metals, some gemstones, and other rare minerals with commercial or industrial value. Locatable mineral development usually involves destructive extraction methods such as blasting, trenching, tunneling, or large-scale earth moving. Although no economically viable locatable mineral deposits have been found in the planning area, a few mining claims are active along the Bruneau River, Salmon Falls Creek, and the Snake River. Even though the potential for development is low fossil resources are at risk from mineral exploration. In the past, several terraces along the Snake River, including the one at Sand Point, have been subjected to destructive and commercially unproductive mining activity. In order to assess the potential impacts to fossil resources from locatable mineral actions, the areas recommended for withdrawal from the mining laws were compared to the PFYC Class 5 geologic units. For purposes of analysis, it is assumed that withdrawal requests will be granted. Alternatives with the most Class 5 acres withdrawn from locatable mineral entry would have the least potential to impact the integrity of paleontological resources. Table 4-223 displays the acres of PFYC Class 5 areas that are open or closed to mineral development.

Table 4-223. Allocation of Potential Fossil Yield Classification Class 5 Areas for Leasable, Salable, and Locatable Mineral Development (Acres)

Mineral Allocations		Alternative						
		No Action	I	II	III	IV	V	VI
Leasable Minerals								
Potential Oil and Gas Areas	Closed	0	4,000	0	1,000	1,000	4,000	1,000
	Open[A]	91,000	87,000	91,000	90,000	90,000	87,000	90,000
Potential Geothermal Areas	Closed	20	4,000	20	1,000	2,000	4,000	1,000
	Open[A]	121,000	117,000	121,000	120,000	119,000	117,000	120,000
Salable Minerals								
Closed		4,000	7,000	6,000	7,000	7,000	10,000	7,000
Open		118,000	114,000	115,000	114,000	114,000	111,000	114,000
Locatable Minerals								
Recommended for Withdrawal		4,000	7,000	4,000	4,000	5,000	7,000	0

[A] Includes open, open with No Surface Occupancy, open with seasonal restrictions, and open with controlled surface use restrictions.

Impacts from Management Specific to the No Action Alternative

Most of the planning area would be open to mineral leasing under the No Action Alternative, including the Sand Point Area of Critical Environmental Concern (ACEC) and all other known paleontological localities. Although a no surface occupancy restriction would apply to these areas, this restriction only protects surface deposits. According to the RFDS for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas

exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas area that would be available for oil and gas leasing. The subsurface impacts related to oil and gas exploration and development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Due to the low level of expected oil and gas activity, the potential for adverse impacts to paleontological resources would be low.

Similarly, according to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur in the planning area as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing. The subsurface impacts related to geothermal exploration and development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Due to the low level of expected geothermal activity, the potential for adverse impacts to paleontological resources would be low.

Under the No Action Alternative, approximately 600 acres (less than 1%) of PFYC Class 5 lands would continue to be managed for material use sites. New sites for salable mineral development would be considered within most of the Class 5 lands, excluding approximately 3% due to restrictions associated with the Sand Point ACEC and the Oregon National Historic Trail (NHT) protective zone. Based on current patterns, an additional 500 acres of salable mineral development is expected on Class 5 lands under the No Action Alternative. The subsurface impacts related to salable mineral development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Due to the low level of expected salable mineral activity, the potential for impacts to paleontological resources would be low.

Approximately 3% of the PFYC Class 5 lands, including the Sand Point ACEC, would be recommended for withdrawal from the general mining laws. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for adverse impacts to occur over the life of the plan is low.

Impacts from Management Common to All Action Alternatives

All action alternatives allow for the development of site-specific resource condition objectives and lease stipulations, which would provide protection for paleontological resources.

Terms and conditions for commercial development of salable mineral sites, under all action alternatives, would contain a prohibition on disturbing important paleontological sites.

Locatable mineral management actions common to all action alternatives address mitigation of unnecessary and undue degradation of resources and negative effects to riparian areas. Since they apply to all alternatives, they produce no measurable differences for analysis.

These actions would reduce or eliminate impacts from authorized mineral activities and maintain the integrity of paleontological resources.

Impacts from Management Specific to Alternative I

Approximately 4% of the 121,000 acres of PFYC Class 5 lands in the high and medium areas of potential geothermal development, including those within the Sand Point ACEC, would be closed to geothermal leasing. The remaining 96% would be open to exploration and development. According to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur as a result of geothermal exploration and development. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing. The subsurface impacts related to geothermal exploration and development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Due to the low level of expected geothermal activity, the potential for impacts to paleontological resources would be low. Unlike the No Action Alternative, Alternative I would close the Sand Point ACEC to mineral leasing thereby maintaining the integrity of fossil deposits at that site.

Of the 91,000 acres of Class 5 lands in the areas of potential oil and gas development, 4% would be closed to leasing and 96% would be open to exploration and development. According to the RFDS for oil

and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur as a result of oil and gas exploration and development. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. The subsurface impacts related to oil and gas exploration and development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Due to the low level of expected oil and gas activity, the potential for impacts to paleontological resources would be low. Unlike the No Action Alternative, Alternative I would close the Sand Point ACEC to mineral leasing thereby maintaining the integrity of fossil deposits at that site.

Approximately 6% of PFYC Class 5 lands, including those within the Sand Point ACEC, would be closed to salable mineral development. The remaining 94% would be open to exploration and development. The acreage of Class 5 lands on which salable mineral development occurs is expected to increase from approximately 600 acres to approximately 1,100 acres over the life of the plan. This is approximately 1% of the area available for salable mineral development. The subsurface impacts related to salable mineral development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Alternative I would reduce the threat to the integrity of fossil resources from salable mineral activity by closing more acres to salable mineral development than the No Action Alternative. Due to the low level of expected salable mineral activity, the potential for impacts to paleontological resources would be low.

Under Alternative I, 6% of the PFYC Class 5 lands, including the Sand Point ACEC, would be recommended for withdrawal from the general mining laws. Threats to the integrity of fossil resources from locatable mineral activity would be reduced in relation to the No Action Alternative. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur is low.

Impacts from Management Specific to Alternative II

Less than 1% of PFYC Class 5 lands would be closed to geothermal leasing, while more than 99%, including the Sand Point ACEC, would be open to exploration and development. Alternative II would make all Class 5 lands within the potential oil and gas areas open to exploration and development. However, as in Alternative I, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed. Impacts to the integrity of paleontological resources from leasable mineral development would be the same as the No Action Alternative.

Approximately 5% of PFYC Class 5 lands would be closed to salable mineral development. The remaining 95%, including lands within the Sand Point ACEC, would be open to exploration and development. The Class 5 acreage on which salable mineral development occurs is expected to increase from approximately 600 acres to approximately 1,100 acres over the life of the plan. This is approximately 1% of the area available for salable mineral development. The subsurface impacts related to salable mineral development on PFYC Class 5 lands would decrease the integrity of affected paleontological resources. Alternative II would reduce the threat to the integrity of fossil resources from salable mineral activity by closing more acres to salable mineral development than the No Action Alternative. Due to the low level of expected salable mineral activity, the potential for impacts to paleontological resources would be low.

Under Alternative II, 3% of the PFYC Class 5 lands would be recommended for withdrawal from the general mining laws. The entire Sand Point fossil locality would not be withdrawn, but portions of the fossil-bearing deposits located within the Oregon NHT corridor would be recommended for withdrawal. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur is low. Impacts to the integrity of paleontological resources from locatable mineral development would be the similar to the No Action Alternative.

Impacts from Management Specific to Alternative III

Approximately 1% of PFYC Class 5 lands, including those within the Sand Point ACEC, would be closed to geothermal leasing while 99% would be open to exploration and development. With only 1,000 Class 5 acres closed, over 99% of the areas of potential oil and gas development would be open to leasing. Threats to the integrity of paleontological resources from both geothermal and oil and gas development

would be slightly reduced in relation to the No Action Alternative due to administrative closure of the Sand Point paleontological site. However, as in the No Action Alternative, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed so the potential for impact is low.

Impacts to paleontological resources from salable mineral actions would be similar to Alternative I.

Under Alternative III, 3% of the PFYC Class 5 lands, including those within the Sand Point ACEC, would be recommended for withdrawal from the general mining laws. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur is low. Impacts to the integrity of paleontological resources from locatable mineral development would be the similar to the No Action Alternative.

Impacts from Management Specific to Alternative IV

Less than 2% of PFYC Class 5 lands, including those within the Sand Point ACEC, would be closed to geothermal leasing while approximately 98% would be open to exploration and development. Oil and gas leasing would be closed on 1% of Class 5 lands within the area of potential oil and gas development and available on the remaining 99%. Impacts to the integrity of paleontological resources would be similar to Alternative III. As in the No Action Alternative, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed so the potential for impacts from leasable mineral development is low.

Impacts to paleontological resources from salable mineral actions would be the same as Alternative I.

Under Alternative IV, 4% of the PFYC Class 5 lands, including those within the Sand Point ACEC, would be recommended for withdrawal from the general mining laws. Threats to the integrity of paleontological resources from locatable mineral development would decrease in relation to the No Action Alternative. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur is low.

Impacts from Management Specific to Alternative V

The impacts from Alternative V are the same as Alternative I for geothermal development and very similar for oil and gas leasing.

Approximately 8% of PFYC Class 5 lands, including those within the Sand Point ACEC, would be closed to salable mineral development. The remaining 92% would be open to exploration and development. The Class 5 acreage on which salable mineral development occurs is expected to increase from approximately 600 acres to approximately 1,500 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Threats to the integrity of paleontological resources from salable mineral activity would decrease in relation to the No Action Alternative due Alternative V's increased acreage under administrative closure.

Under Alternative V, 6% of the PFYC Class 5 lands, including those within the Sand Point ACEC, would be recommended for withdrawal from the general mining laws. Impacts to the integrity of paleontological resources would be the same as Alternative I. Demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur is low.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Less than 1% of PFYC Class 5 lands, including those within the Sand Point ACEC, would be closed to geothermal leasing while approximately 99% would be open to exploration and development. Oil and gas leasing would be closed on 1% of Class 5 lands within the area of potential oil and gas development and available on the remaining 99%. Impacts to the integrity of paleontological resources would decrease in relation to the No Action Alternative. However, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed.

Impacts to the integrity of paleontological resources from salable mineral actions would be the same as Alternative I.

Under Alternative VI, none of the PFYC Class 5 lands, including those within the Sand Point ACEC, would be recommended for withdrawal from the general mining laws. This alternative offers the least protection from impacts related to locatable mineral exploration and development of all alternatives. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur is low.

Impacts from Areas of Critical Environmental Concern Actions

The Sand Point and Lower Bruneau Canyon Areas of Critical Environmental Concern (ACECs) are the only ACECs that include paleontological resources as a relevant and important value. The special management actions associated with these ACECs would protect paleontological resources from development and deterioration and ensure their availability for scientific research and education. Table 4-224 displays the Potential Fossil Yield Classification (PFYC) Class 5 acres that would be managed in the Sand Point and Lower Bruneau Canyon ACECs by alternative.

Table 4-224. Potential Fossil Yield Classification Class 5 Areas Managed in the Sand Point and Lower Bruneau Canyon Areas of Critical Environmental Concern by Alternative

		Alternative						
		No Action	I	II	III	IV	V	VI
Class 5 Acres	Sand Point	300	500	0	500	500	500	500
	Lower Bruneau	0	400	0	0	400	400	300

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would continue management of the existing Sand Point ACEC. Of the 800 acres in the ACEC, 300 acres are PFYC Class 5. The specific management actions for this ACEC are designed to protect the physical integrity of paleontological resources by minimizing or eliminating natural and human-caused surface-disturbing activities and by ensuring that the fossils are available for scientific research and education. The physical integrity of paleontological resources would be maintained on 300 acres of PFYC Class 5 lands within the Sand Point ACEC.

Impacts from Management Specific to Alternatives I, IV, and V

Alternatives I, IV, and V would designate an expanded Sand Point ACEC, increasing its size from 800 acres to 1,000 acres to include additional fossil resources on the adjacent Morgan Property. Approximately 500 acres of PFYC Class 5 lands would be included in the ACEC. Alternatives I, IV, and V would also designate the larger version of the Lower Bruneau Canyon ACEC. Of the 1,000 acres in this ACEC, approximately 400 acres are classified as PFYC Class 5 lands. The specific management actions for these ACECs are designed to protect the physical integrity of paleontological resources by minimizing or eliminating natural and human-caused surface-disturbing activities and by ensuring that the fossils are available for scientific research and education. The physical integrity of paleontological resources would be maintained on 900 acres of PFYC Class 5 lands within the two ACECs.

Impacts from Management Specific to Alternative II

Under Alternative II, neither the Sand Point ACEC nor the Lower Bruneau Canyon ACEC would be designated, and no special management actions to protect the Sand Point and Lower Bruneau Canyon fossils would be in effect. With the exception of the Oregon National Historic Trail protective zone, lands within the current Sand Point ACEC and the nominated Lower Bruneau Canyon ACEC would be open to most forms of commercial development. Invertebrate fossils, which lack statutory protection and comprise the bulk of the resource at both locations, would be particularly vulnerable to damage and loss. The physical integrity of paleontological resources would decrease on the 300 acres currently protected at Sand Point.

Impacts from Management Specific to Alternative III

Alternative III would designate an expanded Sand Point ACEC, increasing its size from 800 acres to 1,000 acres to include additional fossil resources on the adjacent Morgan Property. Approximately 500 acres of PFYC Class 5 lands would be included in the ACEC. The specific management actions for this

ACEC are designed to protect the physical integrity of vertebrate and invertebrate paleontological resources by minimizing or eliminating natural and human-caused surface-disturbing activities and by ensuring that the fossils are available for scientific research and education. Alternative III would not designate the Lower Bruneau Canyon ACEC and no special management actions to protect the vertebrate and invertebrate fossils at that location would be in effect. The physical integrity of paleontological resources would be maintained on 500 acres of PFYC Class 5 lands within the Sand Point ACEC.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate an expanded Sand Point ACEC, increasing its size from 800 acres to 1,000 acres to include additional fossil resources on the adjacent Morgan Property. Approximately 500 acres of PFYC Class 5 lands would be included in the ACEC. Alternative VI would also designate the smaller version of the Lower Bruneau Canyon ACEC. Of the 900 acres in this ACEC, approximately 300 acres are classified as PFYC Class 5 lands. The specific management actions for these ACECs are designed to protect the physical integrity of vertebrate and invertebrate paleontological resources by minimizing or eliminating natural and human-caused surface-disturbing activities and by ensuring that the fossils are available for scientific research and education. The physical integrity of paleontological resources would be maintained on 800 acres of PFYC Class 5 lands within the two ACECs.

Summary of Direct and Indirect Impacts

Each alternative contains a variety of allocations and management actions that affect the integrity of paleontological resources. Table 4-225 displays the acres of Potential Fossil Yield Classification (PFYC) Class 5 areas that are available for some type of development or change to paleontological resources.

Table 4-225. Acres with Potential for Impacts to Potential Fossil Yield Classification Class 5 Lands by Alternative

Management	Alternative						
	No Action	I	II	III	IV	V	VI
Transportation and Travel	59,000	300	0	300	300	300	300
Utility Right-of-Way Corridors	10,000	10,000	10,000	10,000	10,000	10,000	15,000
Wind Energy Development	18,000	13,000	18,000	13,000	13,000	13,000	11,000
Land Tenure	29,000	24,000	34,000	24,000	23,000	23,000	11,000
Oil and Gas Development	91,000	87,000	91,000	90,000	90,000	87,000	90,000
Geothermal Development	121,000	116,000	121,000	120,000	119,000	117,000	120,000
Salable Mineral Development	118,000	114,000	115,000	114,000	114,000	111,000	114,000
Locatable Mineral Development	117,000	114,000	117,000	117,000	116,000	114,000	121,000

Impacts from the No Action Alternative

The No Action Alternative would potentially result in more impacts to the integrity of paleontological resources than any of the alternatives. The No Action Alternative would make more PFYC Class 5 acres vulnerable to impacts from land tenure adjustments than all alternatives except Alternative II. This alternative would also make the most Class 5 acres vulnerable to salable mineral development and to transportation-related impacts, with more than 49% of the Class 5 area open to cross-country motorized vehicle use. Compared to Alternative II, the No Action Alternative would have more areas identified for ROW restrictions and more acres retained in Federal ownership. The No Action Alternative would also

provide special management direction to maintain the integrity of paleontological resources through continued designation of the Sand Point Area of Critical Environmental Concern (ACEC). Overall, the No Action Alternative would result in moderate adverse impacts, primarily due to the number of acres of PFYC Class 5 lands open to cross-country motorized vehicle use.

Impacts from Alternative I

Alternative I would result in fewer impacts to the integrity of paleontological resources than the No Action Alternative and Alternatives II, III, IV, and VI, but slightly more than Alternative V. However, the differences between Alternatives I, III, IV, and V are subtle. Alternative I would have fewer impacts to PFYC Class 5 areas due to leasable and locatable mineral development than Alternatives III, IV, and VI, but similar impacts as Alternative V. Alternative I would have more impacts to Class 5 areas from salable mineral management than Alternative V, but similar impacts as Alternatives IV and VI. Impacts due to ROW development would be greater than for the No Action Alternative, less than Alternative II, and the same as Alternatives I, III, IV, V, and VI. Retention of Class 5 lands in Federal ownership would be greater than under the No Action Alternative and Alternative II, less than Alternative VI, and similar to Alternatives III, VI, and V. Protection for paleontological resources from special management related to ACEC designation would be similar to Alternatives IV, V, and VI and greater than the No Action Alternative and Alternatives II and III. Overall, Alternative I would result in minor adverse impacts to paleontological resources.

Impacts from Alternative II

Alternative II would have the second highest potential to impact the integrity of paleontological resources. Along with the No Action Alternative, it makes the most PFYC Class 5 acres vulnerable to impacts from wind energy development and would retain fewer Class 5 acres in Federal ownership (Zone 1) than any of the other alternatives. Alternative II would also have the least special management directed toward maintaining the integrity of paleontological resources. Overall, Alternative II would result in moderate adverse impacts, primarily due to the lack of ACEC protection for the Sand Point and Lower Bruneau Canyon areas and the number of acres that could leave BLM management through land tenure transactions.

Impacts from Alternative III

Alternative III would result in fewer impacts to the integrity of paleontological resources than the No Action Alternative and Alternative II, but more than Alternatives I, IV, V, and VI; however, the differences between Alternatives I, III, IV, V, and VI are subtle. Alternative III would affect more PFYC Class 5 areas due to mineral development and would retain fewer acres in Federal ownership than Alternative IV, but the two alternatives would have similar impacts from other management. Compared to the No Action Alternative and Alternative II, Alternative III would have less salable mineral development, less wind energy development, and more special management through ACEC designation; more Class 5 lands would be retained in Federal ownership than Alternative II and the No Action Alternative as well. Overall, Alternative III would result in minor adverse impacts to paleontological resources.

Impacts from Alternative IV

Alternative IV would result in fewer impacts to the integrity of paleontological resources than the No Action Alternative and Alternatives II, III, and VI but more than Alternatives I and V; however, the differences between Alternatives I, III, IV, V, and VI are subtle. Alternative IV would have fewer impacts on PFYC Class 5 areas due to leasable and locatable mineral development and utility development than Alternative VI, but would potentially retain fewer acres in Federal ownership. Alternative IV would have slightly more impacts on Class 5 areas due to leasable and locatable mineral development as compared to Alternatives I and V. Overall, Alternative IV would result in minor adverse impacts to paleontological resources.

Impacts from Alternative V

Alternative V would result in fewer impacts to the integrity of paleontological resources than any of the other alternatives; however, the differences between Alternatives I, III, IV, V, and VI are subtle. Alternative V would have fewer PFYC Class 5 areas affected by salable mineral development than Alternative I, but other management would be similar to Alternatives I, III, IV, and V. Impacts to paleontological resources

under this alternative would be similar to Alternative VI except that Alternative V makes fewer acres available for utility development and more acres available for disposal through land tenure transactions. Overall, Alternative V would result in minor adverse impacts to paleontological resources.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would result in fewer impacts to the integrity of paleontological resources than the No Action Alternative and Alternatives II and III, but slightly more than Alternatives I, IV, and V; however, the differences between Alternatives I, III, IV, V, and VI are subtle. Alternative VI would make fewer PFYC Class 5 acres available for disposal through land tenure transactions than any of the alternatives but would also make the most acres available for utility development and locatable mineral development. Alternative VI would provide more protection for paleontological resources through ACEC designation than the No Action Alternative and Alternatives II and III. However, Alternative VI would have slightly more impacts on Class 5 areas due to leasable mineral development as compared to Alternatives I and V. Overall, Alternative VI would result in minor adverse impacts to paleontological resources.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

This section considers past, present, and reasonably foreseeable future actions that would affect paleontological resources in and adjacent to the planning area. The Snake River Plain, from Grand View in the west to Salmon Falls Creek in the east, forms the geographic boundary of the cumulative impacts analysis area. This area contains two of the most productive fossil-bearing geologic units in Idaho: the Glenns Ferry and Chalk Hills Formations. In addition to BLM-managed lands, the area includes National Park Service lands, State lands, and private holdings. In the 1980s, steps were taken to preserve the two largest concentrations of fossils in or near the planning area. In 1987, the BLM designated the Sand Point Area of Critical Environmental Concern (ACEC) and the Hagerman Paleontologic ACEC with special management provisions to reduce impacts to fossil deposits from a variety of sources including unauthorized fossil collecting, cross-country motorized vehicle use, locatable minerals exploration, livestock grazing, and erosion. In 1988, the National Park Service acquired the Hagerman ACEC through legislation establishing the Hagerman Fossil Beds National Monument. Current management of these sites has eliminated or reduced most threats to the integrity of paleontological resources.

Past, present, and reasonably foreseeable actions for the following resource uses cumulatively affect paleontological resources:

- Transportation and Travel,
- Land Use Authorizations, and
- Minerals.

These actions are described in the *Introduction* to this chapter.

With regard to transportation and travel actions, almost half of the BLM-managed Potential Fossil Yield Classification (PFYC) Class 5 lands in the analysis area are open to cross-country motorized vehicle use outside of special designations and, therefore, are vulnerable to travel-related impacts. The Sand Point ACEC, Snake River Birds of Prey National Conservation Area, Oregon National Historic Trail, Hagerman Fossil Beds National Monument, and lands within Owyhee County restrict motorized travel to designated routes. In the future, the BLM's Bruneau, Burley, and Shoshone Field Offices will be preparing resource management plans that are expected, in line with current policy, to limit motorized travel to designated routes.

Each of the land use authorization projects discussed in the *Introduction* require substantial surface and subsurface disturbance in or near PFYC Class 5 geologic units. If wind energy development projects prove to be profitable, project proposals are expected to increase on Federal, State, and private lands.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Under current management, extensive portions of BLM-managed land in the planning area would remain open to cross-country motorized vehicle use. As a result, riders from surrounding areas with more restrictions may look for recreation opportunities in the planning area, increasing existing impacts to Potential Fossil Yield Classification (PFYC) Class 5 lands and spreading new impacts to previously undisturbed areas.

The No Action Alternative has more PFYC Class 5 acres excluded from right-of-way (ROW) development than any of the other alternatives and could, therefore, have a greater effect on ROW alignment, which could lead to a greater use of State and private lands to transect the planning area. Paleontological resources on these lands would not receive the protections afforded by Federal law and regulations.

The No Action Alternative would also make the most PFYC Class 5 lands available for salable mineral development. When added to the existing and proposed wind energy developments on adjacent private lands, the No Action Alternative has a higher potential for cumulative impacts to the integrity of paleontological resources than Alternatives I, III, IV, V, and VI.

Cumulative Impacts from Alternatives I, III, and IV

Under these alternatives, the area available for cross-country motorized vehicle use would be substantially reduced. In the short term, this may result in increased impacts to paleontological resources on adjacent BLM lands or State lands with fewer cross-country motorized travel restrictions. In the long term, designation of off-highway vehicle trail systems in the planning area and updated travel plans in adjacent BLM field offices should result in a reduction in direct, indirect, and cumulative impacts to paleontological resources from cross-country motorized vehicle use throughout the analysis area.

Construction impacts to PFYC Class 5 units from ROW and wind energy developments would affect paleontological resources on Federal, State, and private lands. With linear ROWs, the impacts to State and private lands should occur in proportion to the overall land ownership pattern within the ROW. With wind energy developments, more restrictions on BLM lands could translate to increased development, and consequent impacts to fossils, on State and private lands.

The direct and indirect impacts of land use authorizations under these alternatives, when added to the present and reasonably foreseeable future energy and mineral developments on Federal, State, and private lands would result in fewer cumulative impacts than the No Action Alternative and Alternative II and about the same as Alternative V.

Cumulative Impacts from Alternative II

Cumulative impacts from cross-country motorized vehicle use would be similar to those described for Alternatives I, III, and IV although the number of designated routes is expected to be higher.

Alternative II would place the fewest restrictions on ROW locations and would potentially affect the highest percentage of PFYC Class 5 units in the expected wind energy development area of all the alternatives.

Based on the analysis of direct and indirect impacts and the current and expected impacts to PFYC Class 5 paleontologic units on State and private lands, Alternative II would produce more cumulative impacts to paleontological resources than the No Action Alternative and Alternatives I, III, IV, V, and VI.

Cumulative Impacts from Alternative V

Cumulative impacts from cross-country motorized vehicle use would be similar to those described under Alternatives I, III, IV, and VI, although Alternative II would close slightly more PFYC Class 5 acres to such use.

Alternative V would close the most Class 5 acres to salable mineral development. Sand and gravel needs that cannot be met in the 92% of Class 5 lands that remain available for development would be met through the development of State and private lands.

Based on the analysis of direct and indirect impacts and the current and expected impacts to PFYC Class 5 paleontologic units on State and private lands, Alternative V would produce fewer cumulative impacts to paleontological resources than the No Action Alternative and Alternatives I, II, III, IV, and VI.

Cumulative Impacts from Alternative VI (Proposed RMP)

Cumulative impacts from cross-country motorized vehicle use would be similar to those described under Alternatives I, III, IV, and V.

Alternative VI would designate slightly more acres for utility development than any of the alternatives and would be similar to the No Action Alternative and Alternatives I, III, IV, and V in terms of wind energy development on PFYC Class 5 lands. Salable mineral development would be more than Alternative V but less than Alternatives II and III and the No Action Alternative. Alternative VI would make more Class 5 acres available for locatable mineral development than any of the alternatives.

Based on the analysis of direct and indirect impacts and the current and expected impacts to PFYC Class 5 paleontologic units on State and private lands, Alternative VI would produce fewer cumulative impacts to paleontological resources than the No Action Alternative and Alternative II, but may produce more than Alternatives I, III, IV, and V.

4.3.12. Cultural Resources

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to cultural resources:

- **The physical integrity of important cultural resources (i.e., archaeological, historic, and traditional cultural sites determined to be worthy of long-term management)** – Integrity, in a cultural resource context, is the ability of a site or property to convey its importance. In the planning area, most cultural resources are important for their traditional, scientific, and public values (Appendix G). The great majority of sites are prehistoric and historic archaeological sites. For these sites, integrity is primarily related to the condition of their archaeological deposits and constructed features (i.e., the degree to which they are unmixed, intact, and retain spatial patterning among artifacts and cultural features). Actions that result in ground disturbance have a high potential to impact the integrity of cultural resources. Actions that limit or eliminate surface-disturbing activities would protect the integrity of cultural resources.
- **The setting (i.e., the physical, visual, or acoustic environment) of cultural resources** – Landscapes, viewsheds, man-made features and soundscapes are integral components of many places of traditional cultural importance to Native American tribes and to those historic sites with interpretive potential and public value. In the planning area, the integrity of the historical setting is a critical element for intact segments of the Oregon National Historic Trail (NHT) and Kelton and Toana Freight Roads. In addition, certain topographic features and archaeological, historic, and rock art sites play prominent roles in contemporary traditional Native American religious beliefs and practices. Actions that affect the viewshed of these places, add new facilities, or add loud and sustained noise could negatively affect the attributes of a place of traditional cultural importance to Native American tribes that give it value and may diminish a historic site's ability to convey its importance to the public. Actions that reduce or eliminate physical, visual, and acoustic impacts in the vicinity of historic roads and trails and places of traditional cultural importance would enhance the values and functions associated with these sites.

Methods and Assumptions

Impacts to cultural resources from management in the following sections of Chapter 2 were analyzed in detail: *Cultural Resources*, *Wildland Fire Ecology and Management*, *Visual Resources*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations*, *Minerals*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for cultural resources and would be subject to National Environmental Policy Act and National Historic Preservation Act (NHPA) Section 106 compliance. Impacts from management for cultural resources can be found under *Impacts from Cultural Resources Actions* in the *Tribal Rights and Interests, Land Use Authorizations* and *Wilderness* sections.

Impacts to cultural resources are difficult to quantify with precision because the management actions being analyzed would be applied over the entire planning area; the alternatives do not identify specific projects or the exact locations where impacts would occur. Also, cultural resource inventory information is not available for the entire planning area. It is possible, however, to estimate impacts based on the relationships between resource use allocations, activities, and restrictions and areas where cultural resources are more or less likely to be found. To aid in the evaluation of the effects of management decisions on cultural resources, the BLM developed a landscape-scale model of site density for the planning area. As described in Chapter 3, the model is based on previous site density projections which used elevation and distance to water criteria (Fawcett, 1997; Young, 1984) and refined by data from more recent intensive cultural resource inventories. The purpose of the model is to predict whether relatively large, moderate, or low numbers of cultural resources are present within a given portion of the planning area. The model cannot predict specific site locations or the actual number of sites affected by a given decision, nor is it designed to limit or encourage particular uses in particular areas or serve as a substitute for cultural resource inventory and consultation. It is simply a tool for predicting relative site densities. The High Cultural Resource Density Zone, located in the southern portion of the planning area and along streams, consists of approximately 673,000 acres; the Moderate Density Zone consists of 512,000 acres in the central portion, and the Low Density Zone consists of 187,000 acres in the northern portion of the planning area.

For this analysis, the site density model was used to compare the footprint of allocations and management actions expected to affect the integrity and setting of cultural resources within high, medium, and low site density zones. Effects are expressed in terms of potential increases or decreases in levels of surface disturbance or, in some cases, in changes to the visual character of the landscape. While not precise, this method helps identify quantifiable differences among alternatives.

The following assumptions were used when analyzing impacts to cultural resources:

- The site density model described in Chapter 3 adequately represents the density of cultural resources in the planning area and can be compared to management decisions to produce a quantifiable assessment of probable effects at the landscape scale.
- The potential for impacts to cultural resources would be proportional to the acres of land in each density zone that overlap areas affected by surface-disturbing management actions or allocations.
- Management actions and land use allocations that restrict surface development and disturbance generally prevent, reduce, or eliminate impacts to the integrity of cultural resources.
- Adverse impacts to cultural resources related to future Federal undertakings would be reduced or eliminated through stipulations or mitigation measures developed in consultation with the affected tribes, State Historic Preservation Officers (SHPOs), project proponents and other affected parties, and Advisory Council on Historic Preservation, as appropriate, pursuant to Section 106 of the NHPA and the implementing regulations found at 36 CFR Part 800. These protective measures would be developed during project planning and enforced during implementation.
- Given the BLM's preservation obligations, which include site identification, evaluation, and mitigation of effects (BLM 8100 Manual; NHPA), management actions and land use allocations that lead to increased physical impacts to important cultural resources would also lead to increased economic impacts to the BLM or to project proponents.

- Cultural resources are fragile and irreplaceable. In general, impacts to cultural resources from surface disturbance are long term.

Direct and Indirect Impacts

Impacts from Cultural Resource Actions

The following indicators were used to analyze the impacts of Cultural Resource actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

Impacts from Management Specific to the No Action Alternative

In addition to standard regulatory compliance direction, the No Action Alternative requires that all "significant cultural sites" (i.e., those determined eligible for the National Register) would be retained in Federal ownership, establishes protective zones for the Oregon National Historic Trail (NHT) and protective corridors for the Kelton Freight Road, and identifies seven areas for project-level planning and special management. The management actions for this alternative promote cultural resource protection through avoidance of adverse effects or mitigation and would help maintain the physical integrity and setting of important cultural resources.

Impacts from Management Common to All Action Alternatives

Management actions under this heading provide guidelines for the protection of cultural resources. The action alternatives differ from the No Action Alternative in their allocation of cultural resources to traditional, scientific, conservation, public, or experimental value; their explicit recognition of the role of tribal consultation in cultural resource management; and their addition of the Toana Freight Road and associated protective corridor to the previously established Oregon NHT protective zone and Kelton Freight Road protective corridor. In addition, the action alternatives provide more detailed, updated direction for proactive cultural resource work and for standard National Historic Preservation Act Section 106 compliance. These actions would maintain the physical integrity and setting of important cultural resources.

Impacts from Management Specific to Alternative I

Alternative I differs from the No Action Alternative in that it would allow the flexibility, under limited circumstances, to exchange lands containing important cultural resources for lands with resources of equal or greater natural or cultural resource value. It is difficult to assess the effects of this action in the absence of a specific proposal; however, given tribal and SHPO involvement, it is expected that adverse effects to cultural resources would be satisfactorily resolved before lands containing important sites leave Federal ownership.

Alternative I would create a 300-foot buffer around playas to protect associated cultural resources. New ground disturbance would be avoided or minimized within this protective zone.

These actions would maintain the physical integrity and setting of important cultural resources.

Impacts from Management Specific to Alternative II

Alternative II would allow lands containing important cultural resources to leave Federal ownership through exchange or sale, under limited circumstances and after appropriate consultation and mitigation, with no requirement to balance the loss with the acquisition of lands with resources of equal or greater value. Although such transactions have been rare in the past, this management action has a greater potential to affect the integrity of important cultural resources than the No Action Alternative and the other action alternatives.

Under Alternative II, the protective zone surrounding playas would consist of a 150-foot buffer.

Alternative II provides slightly less protection for the integrity and setting of cultural resources than the other alternatives.

Impacts from Management Specific to Alternative III

Under this alternative, the impacts to important cultural resources from land tenure adjustments would be the same as Alternative I.

Alternative III offers less protection for cultural resources associated with playas than any of the action alternatives. As with Alternative II, the protective zone would be 150 feet surrounding playas, but this restriction would not apply to fire suppression activities.

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Impacts from cultural resources actions in Alternatives IV, V, and VI are essentially the same as Alternative I. The differences include a greater emphasis on research and monitoring using agreements and partnerships with tribes, historical societies, and colleges, and increased protection for undeveloped springs. In comparison to the No Action Alternative and Alternatives I, II, and III, this proactive approach to cultural resource management would increase the BLM's ability to protect important sites and to collect important information for use in future land use decisions.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

Wildland fire impacts the integrity of cultural resources in several ways. Direct effects include the destruction of historic structures, wooden parts of farming and ranching equipment, and other organic artifacts; damage to pigments and stone surfaces at rock art sites; and in some circumstances, physical alteration of obsidian and ceramic artifacts (Buenger, 2003; Johnson, 2004). Indirect effects include surface damage from fire suppression actions (e.g., dozer or hand-dug fire lines, cross-country travel by heavy fire trucks, fire camps, and staging areas) and increased erosion and artifact theft due to the loss of vegetative cover. Because the footprint of suppression activities is always smaller than the footprint of the fire, the most important factor affecting cultural resource integrity is fire size. Priority for firefighting is attached to critical suppression areas, and it is assumed that suppression efforts would result in smaller fires. Therefore, cultural resources in critical suppression areas should suffer fewer impacts than cultural resources in conditional suppression areas. Likewise, it is expected that use of minimum impact suppression tactics (MIST) would protect the integrity of cultural resources by reducing physical impacts to sites. It follows then, that alternatives with more acres in the High Cultural Resource Density Zone within critical suppression areas and subject to MIST would result in fewer impacts to cultural resources than alternatives with fewer acres in the same categories. While this assumption is necessary for the comparison of alternatives, it is important to note that predicting the actual effects of future wildland fires is complicated by a number of uncontrollable factors (e.g., environmental variables, the number of simultaneous fire starts, and the number and type of firefighting resources available).

Impacts from Management Specific to the No Action Alternative

The No Action Alternative calls for full suppression throughout the planning area; because of the lack of any prioritization for fire suppression efforts, there would be no areas in the planning area that are anticipated to have fewer impacts to cultural resources. Special management restrictions on suppression actions (similar to MIST) would apply to the wilderness, the Wilderness Study Area, Kelton Freight Road, and Oregon National Historic Trail. These restrictions would help maintain the physical integrity and setting of cultural resources within the targeted areas (approximately 73,000 acres). The current pattern of increasing wildland fire size and frequency is expected to continue under existing management and impacts to the integrity of important cultural resources would continue to increase as a result.

Impacts from Management Specific to Alternative I

Out of the 673,000 acres in the High Cultural Resource Density Zone, 48% would be in critical suppression areas and 52% would be in conditional suppression areas. Of the 512,000 acres in the Moderate Cultural Resource Density Zone, 27% would be in critical suppression areas and 73% would be in conditional suppression areas. Of the 187,000 acres in the Low Cultural Resource Density Zone, 16% would be in critical suppression areas and 84% would be in conditional suppression areas. MIST would apply to approximately 134,000 acres. Prioritizing wildland fire suppression and expanding the use of MIST is expected to reduce impacts to the integrity of important cultural resources in relation to existing management.

Table 4-226. Fire Suppression Areas by Cultural Resource Density Zone in Alternative I (Acres)

Fire Suppression Area	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Critical Suppression Areas	325,000	137,000	30,000	**492,000**
Conditional Suppression Areas [A]	348,000	375,000	157,000	**880,000**

[A] Represents acres with higher potential for impacts to the physical integrity and setting of cultural resources due to wildland fires.

Impacts from Management Specific to Alternative II

Out of the 673,000 acres in the High Cultural Resource Density Zone, 15% would be in critical suppression areas and 85% would be in conditional suppression areas. Of the 512,000 acres in the Moderate Cultural Resource Density Zone, 8% would be in critical suppression areas and 92% would be in conditional suppression areas. Of the 187,000 acres in the Low Cultural Resource Density Zone, 16% would be in critical suppression areas and 84% would be in conditional suppression areas. MIST would apply to approximately 78,000 acres; slightly more than the No Action Alternative. Prioritizing wildland fire suppression is expected to reduce impacts to the integrity of important cultural resources, however, Alternative II places 88% of the planning area in the conditional suppression category. The potential for impacts to cultural resources would be similar to the No Action Alternative.

Table 4-227. Fire Suppression Areas by Cultural Resource Density Zone in Alternative II (Acres)

Fire Suppression Area	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Critical Suppression Areas	102,000	39,000	30,000	**171,000**
Conditional Suppression Areas [A]	571,000	473,000	157,000	**1,201,000**

[A] Represents acres with higher potential for impacts to the physical integrity and setting of cultural resources due to wildland fires.

Impacts from Management Specific to Alternative III

Out of the 673,000 acres in the High Cultural Resource Density Zone, 46% would be in critical suppression areas and 54% acres would be in conditional suppression areas. Of the 512,000 acres in the Moderate Cultural Resource Density Zone, 26% would be in critical suppression areas and 74% would be in conditional suppression areas. Of the 187,000 acres in the Low Cultural Resource Density Zone, 16% would be in critical suppression areas and 84% would be in conditional suppression areas. MIST would apply to approximately 64,000 acres – least of all the alternatives. The acres prioritized for suppression are similar to Alternative I. Prioritizing wildland fire suppression is expected to reduce impacts to the integrity of important cultural resources.

Table 4-228. Fire Suppression Areas by Cultural Resource Density Zone in Alternative III (Acres)

Fire Suppression Area	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Critical Suppression Areas	313,000	134,000	30,000	**477,000**

Fire Suppression Area	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Conditional Suppression Areas [A]	360,000	378,000	157,000	**895,000**

[A] Represents acres with higher potential for impacts to the physical integrity and setting of cultural resources due to wildland fires.

Impacts from Management Specific to Alternative IV

Out of the 673,000 acres in the High Cultural Resource Density Zone, 59% would be in critical suppression areas and 41% acres would be in conditional suppression areas in Alternative IV-A. In Alternative IV-B, 56% would be in critical suppression areas and 44% would be in conditional suppression areas.

Table 4-229. Fire Suppression Areas by Cultural Resource Density Zone in Alternative IV (Acres)

Fire Suppression Area	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Critical Suppression Areas				
Alternative IV-A	400,000	163,000	31,000	**594,000**
Alternative IV-B	374,000	148,000	31,000	**553,000**
Conditional Suppression Areas [A]				
Alternative IV-A	273,000	349,000	156,000	**778,000**
Alternative IV-B	299,000	364,000	156,000	**819,000**

[A] Represents acres with higher potential for impacts to the physical integrity and setting of cultural resources due to wildland fires.

Out of the 512,000 acres in the Moderate Cultural Resource Density Zone, 32% would be in critical suppression areas and 68% would be in conditional suppression areas in Alternative IV-A. In Alternative IV-B, 29% would be in critical suppression areas and 71% would be in conditional suppression areas.

Out of the 187,000 acres in the Low Cultural Resource Density Zone, 17% would be in critical suppression areas and 83% would be in conditional suppression areas in both Alternatives IV-A and IV-B.

MIST would apply to approximately 171,000 acres – most of all the alternatives. Prioritizing wildland fire suppression and expanding the use of MIST is expected to reduce impacts to the integrity of important cultural resources.

Impacts from Management Specific to Alternative V

Out of the 673,000 acres in the High Cultural Resource Density Zone, 96% would be in critical suppression areas and 4% would be in conditional suppression areas. Of the 512,000 acres in the Moderate Cultural Resource Density Zone, 72% would be in critical suppression areas and 28% would be in conditional suppression areas. Of the 187,000 acres in the Low Cultural Resource Density Zone, 16% would be in critical suppression areas and 84% would be in conditional suppression areas. Alternative V would place the most acres in the critical suppression category including almost all of the High Cultural Resource Density Zone. MIST would apply to approximately 108,000 acres. Prioritizing wildland fire suppression and expanding the use of MIST is expected to reduce impacts to the integrity of important cultural resources.

Table 4-230. Fire Suppression Areas by Cultural Resource Density Zone in Alternative V (Acres)

Fire Suppression Areas	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Critical Suppression Areas	645,000	366,000	30,000	**1,041,000**
Conditional Suppression Areas [A]	28,000	146,000	157,000	**331,000**

[A] Represents acres with higher potential for impacts to the physical integrity and setting of cultural resources due to wildland fires.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Out of the 673,000 acres in the High Cultural Resource Density Zone, 48% would be in critical suppression areas and 52% would be in conditional suppression areas. Of the 512,000 acres in the Moderate Cultural Resource Density Zone, 31% would be in critical suppression areas and 69% would be in conditional suppression areas. Of the 187,000 acres in the Low Cultural Resource Density Zone, 60% would be in critical suppression areas and 40% would be in conditional suppression areas. MIST would apply to approximately 129,000 acres. Prioritizing wildland fire suppression and expanding the use of MIST is expected to reduce impacts to the integrity of important cultural resources.

Table 4-231. Fire Suppression Areas by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

Fire Suppression Areas	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Critical Suppression Areas	324,000	160,000	113,000	**597,000**
Conditional Suppression Areas [A]	349,000	352,000	74,000	**775,000**

[A] Represents acres with higher potential for impacts to the physical integrity and setting of cultural resources due to wildland fires.

Impacts from Visual Resource Actions

The following indicator was used to analyze the impacts of Visual Resource actions to cultural resources:

- The setting of cultural resources.

Managing public lands according to the Visual Resource Management (VRM) Class objectives identified in Chapter 2 would affect the setting of important cultural resources by controlling the manner and degree of authorized changes to the visual landscape within a particular VRM Class. VRM Classes I and II maintain the setting of cultural resources by restricting developments that alter the existing viewshed. VRM Class III management would allow moderate alteration of the existing landscape, and VRM Class IV managed lands would provide little or no restriction on visual intrusions to the landscape. For this analysis, the acres in each VRM Class for each alternative are compared with the Cultural Resource Density Zones. Alternatives that contain the most VRM Class I and Class II lands in the High Cultural Resource Density Zone would result in the least disturbance to the setting of cultural resources.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 241,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 31% of lands in the High Cultural Resource Density Zone, 4% of lands in the Moderate Cultural Resource Density Zone, and 6% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,130,000 acres would have more potential to change, as they would be in VRM Classes III and IV.

Table 4-232. Visual Resource Management Classes by Cultural Resource Density Zone in the No Action Alternative (Acres)

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class I	106,000	16,000	8,000	**130,000**
Class II	102,000	6,000	3,000	**111,000**
Class III	201,000	69,000	14,000	**284,000**
Class IV	264,000	420,000	163,000	**847,000**

Impacts from Management Specific to Alternative I

Under Alternative I, a total of 296,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 43% of lands in the High Cultural Resource Density Zone, 2% of lands in the Moderate Cultural Resource Density Zone, and less than 1% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,075,000 acres would have more potential to change, as they would be in VRM Classes III and IV. This alternative would protect the visual setting of cultural resources on 55,000 more acres than the No Action Alternative.

Table 4-233. Visual Resource Management Classes by Cultural Resource Density Zone in Alternative I (Acres)

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class I	96,000	9,000	400	**105,000**
Class II	191,000	0	0	**191,000**
Class III	94,000	2,000	47,000	**143,000**
Class IV	292,000	501,000	140,000	**933,000**

Impacts from Management Specific to Alternative II

Under Alternative II, a total of 80,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 11% of lands in the High Cultural Resource Density Zone, 1% of lands in the Moderate Cultural Resource Density Zone, and 0% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,292,000 acres would have more potential to change, as they would be in VRM Classes III and IV. Alternative II would protect the visual setting of cultural resources on 161,000 fewer acres than the No Action Alternative.

Table 4-234. Visual Resource Management Classes by Cultural Resource Density Zone in Alternative II (Acres)

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class I	65,000	5,000	0	**70,000**
Class II	10,000	0	0	**10,000**
Class III	25,000	200	100	**25,000**
Class IV	573,000	507,000	187,000	**1,267,000**

Impacts from Management Specific to Alternative III

Under Alternative III, a total of 81,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 12% of lands in the High Cultural Resource Density Zone, 1% of lands in the Moderate Cultural Resource Density Zone, and 0% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,290,000 acres would have more potential to change, as they would be in VRM Classes III and IV. Impacts to the visual setting of cultural resources would be similar to Alternative II.

Table 4-235. Visual Resource Management Classes by Cultural Resource Density Zone in Alternative III (Acres)

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class I	66,000	5,000	0	**71,000**
Class II	10,000	0	00	**10,000**
Class III	297,000	2,000	47,000	**346,000**
Class IV	300,000	505,000	140,000	**945,000**

Impacts from Management Specific to Alternative IV

Under Alternative IV, a total of 196,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 26% of lands in the High Cultural Resource Density Zone, 3% of lands in the Moderate Cultural Resource Density Zone, and 1% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,176,000 acres would have more potential to change, as they would be in VRM Classes III and IV. Alternative IV would protect the visual setting of cultural resources on 45,000 fewer acres than the No Action Alternative.

Table 4-236. Visual Resource Management Classes by Cultural Resource Density Zone in Alternative IV (Acres)

VRM Class		Cultural Resource Density Zone			Total Acres
		High Density	Moderate Density	Low Density	
Class I		113,000	13,000	1,000	**127,000**
Class II		65,000	4,000	0	**69,000**
Class III	Alternative IV-A	262,000	63,000	49,000	**374,000**
	Alternative IV-B	247,000	47,000		**343,000**
Class IV	Alternative IV-A	233,000	432,000	137,000	**802,000**
	Alternative IV-B	248,000	448,000		**833,000**

Impacts from Management Specific to Alternative V

Under Alternative V, a total of 370,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 52% of lands in the High Cultural Resource Density Zone, 4% of lands in the Moderate Cultural Resource Density Zone, and 0% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,001,000 acres would have more potential to change, as they would be in VRM Classes III and IV. This alternative would protect the setting of cultural resources on 129,000 more acres than the No Action Alternative.

Table 4-237. Visual Resource Management Classes by Cultural Resource Density Zone in Alternative V (Acres)

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class I	65,000	5,000	0	**70,000**
Class II	287,000	13,000	0	**300,000**
Class III	295,000	331,000	24,000	**650,000**
Class IV	26,000	163,000	163,000	**352,000**

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, a total of 166,000 acres would be managed to retain their existing visual character (VRM Class I and II). These areas include 21% of lands in the High Cultural Resource Density Zone, 1% of lands in the Moderate Cultural Resource Density Zone, and 11% of lands in the Low Cultural Resource Density Zone. The visual character of the remaining 1,205,000 acres would have more potential to change, as they would be in VRM Classes III and IV. Alternative VI would protect the visual setting of cultural resources on 74,000 fewer acres than the No Action Alternative.

Table 4-238. Visual Resource Management Classes by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class I	81,000	5,000	0	**86,000**
Class II	60,000	0	20,000	**80,000**

VRM Class	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Class III	235,000	1,000	12,000	**248,000**
Class IV	297,000	506,000	155,000	**958,000**

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

Livestock trampling is known to cause horizontal and vertical displacement of artifacts; break or alter stone tools and ceramics (Broadhead, 1999; Osborn et al., 1987); compact soils; and, in riparian settings, damage streambanks leading to accelerated erosion and soil loss (Fleischner, 1994; Kauffman et al., 1983). These impacts diminish the physical integrity of archaeological sites by obscuring spatial relationships among surface artifacts and by mixing more recent cultural materials with older subsurface deposits. Studies indicate the severity of livestock grazing effects is correlated with the intensity of grazing use (Clary and Kinney, 2000; Trimble and Mendel, 1995a). The planning decision with the greatest implication for cultural resource physical integrity and setting is the allocation of lands available and unavailable for livestock grazing. Areas available for grazing would be affected although impacts are not expected to occur uniformly across the landscape. In general, livestock are expected to graze within two miles of accessible water, to avoid steep slopes, and to seek shelter during inclement weather. Since humans have similar requirements for water and shelter there is an overlap between livestock and human use of the landscape. Many variables affect this relationship, including fences and artificial water systems, making it difficult to reliably predict the number of acres which would be physically impacted by livestock grazing under each alternative. This analysis focuses on areas unavailable for livestock grazing (Table 4-239) because effects on the physical integrity of cultural resources are more certain; no livestock impacts would occur in areas unavailable for grazing.

Table 4-239. Areas Unavailable for Livestock Grazing by Cultural Resource Density Zone by Alternative (Acres)

Cultural Resource Density Zone	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
High Density	40,000	53,000	43,000	44,000	93,000	78,000	157,000	45,000
Moderate Density	4,000	8,000	5,000	5,000	38,000	21,000	106,000	5,000
Low Density	7,000	13,000	7,000	7,000	8,000	9,000	40,000	7,000
Total Acres Unavailable for Livestock Grazing	**51,000**	**74,000**	**55,000**	**56,000**	**139,000**	**108,000**	**303,000**	**57,000**

Impacts from Management Specific to the No Action Alternative

The No Action Alternative allocates most of the planning area to livestock grazing. Only 51,000 acres are not available for livestock use. Approximately 6% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 4% of the Low Density Zone would be unavailable for livestock grazing. This alternative would make more land available for livestock grazing and the associated impacts to cultural resource physical integrity and setting than any of the alternatives.

Impacts from Management Specific to Alternative I

This alternative would make 74,000 acres unavailable for livestock grazing, including 8% of the High Cultural Resource Density Zone, 2% of the Moderate Cultural Resource Density Zone, and 7% of the Low

Cultural Resource Density Zone. This alternative would eliminate potential grazing impacts to cultural resource physical integrity and setting on 23,000 acres more than the No Action Alternative.

Impacts from Management Specific to Alternative II

This alternative would make 55,000 acres unavailable for livestock grazing, including 6% of the High Cultural Resource Density Zone, 1% of the Moderate Cultural Resource Density Zone, and 4% of the Low Cultural Resource Density Zone. Alternative II would eliminate grazing impacts on 4,000 more acres than the No Action Alternative and has more pro-active management actions designed to reduce impacts to the physical integrity and setting of cultural resources.

Impacts from Management Specific to Alternative III

This alternative would make 56,000 acres unavailable for livestock grazing, including 7% of the High Cultural Resource Density Zone, 1% of the Moderate Cultural Resource Density Zone, and 4% of the Low Cultural Resource Density Zone. Alternative III would eliminate grazing impacts to the physical integrity and setting of cultural resources on 5,000 more acres than the No Action Alternative and on 1,000 more acres than Alternative II. In addition, the alternative has more pro-active management actions designed to reduce impacts to cultural resources than the No Action Alternative.

Impacts from Management Specific to Alternative IV

In Alternative IV-A, 139,000 acres would be unavailable for livestock use, including 14% of the High Cultural Resource Density Zone, 7% of the Moderate Cultural Resource Density Zone, and 4% of the Low Cultural Resource Density Zone. In Alternative IV-B, 108,000 acres would be unavailable for livestock use, including 12% of the High Cultural Resource Density Zone, 4% of the Moderate Cultural Resource Density Zone, and 5% of the Low Cultural Resource Density Zone. Alternative IV-A would eliminate grazing impacts to cultural resources on 88,000 acres more than the No Action Alternative and Alternative IV-B would eliminate grazing impacts on 57,000 acres more than the No Action Alternative. Only Alternative V would eliminate potential grazing impacts to the physical integrity and setting of cultural resources on more acres.

Impacts from Management Specific to Alternative V

This alternative would make 303,000 acres unavailable for livestock grazing, including 23% of the High Cultural Resource Density Zone, 21% of the Moderate Cultural Resource Density Zone, and 21% of the Low Cultural Resource Density Zone. This alternative would eliminate grazing impacts to the physical integrity and setting of cultural resources on 252,000 more acres than the No Action Alternative and 164,000 more than Alternative IV-A, the alternative with the next highest acreage removed from livestock grazing.

Impacts from Management Specific to Alternative VI (Proposed RMP)

This alternative would make 57,000 acres unavailable for livestock grazing, including 7% of the High Cultural Resource Density Zone, 1% of the Moderate Cultural Resource Density Zone, and 4% of the Low Cultural Resource Density Zone. Alternative VI is similar to Alternative III in terms of lands available and unavailable for livestock grazing and the potential for impacts to the physical integrity and setting of important cultural resources.

Impacts from Recreation Actions

The following indicators were used to analyze the impacts of Recreation actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

A variety of impacts can occur when cultural resources and recreation activities share the same space. Inadvertent impacts related to camping, hunting, fishing, and boating include surface disturbance from digging fire pits, trash pits, and latrines; vegetation loss and streambank erosion from trails and human trampling; dismantling of historic structures; and construction of new features (Sullivan III et al., 2002). All

of these activities can diminish the physical integrity and setting of cultural resources by modifying surface artifact relationships or mixing surface and subsurface cultural material.

Recreational use of public lands in the planning area is expected to increase along with general population growth. It is reasonable to assume that increased recreational use would increase the potential for inadvertent impacts to cultural resources. Focused management associated with Special Recreation Management Area (SRMA) designations, in areas of concentrated recreational use, would help reduce impacts to cultural resources, especially in areas where use is already established and is likely to continue with or without active management. Unfocused or reactive management of such areas would increase the potential for adverse impacts. For this analysis, SRMAs where recreation activity is expected to increase, based on recreation objectives, are compared to the Cultural Resource Density Model.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would allocate five SRMAs totaling 78,000 acres. These SRMAs are not mapped and no detailed descriptions or management guidelines were included in the 1987 Jarbidge RMP. Although precise comparisons are not possible, based on general location, the Hagerman-Owsley Bridge SRMA is mostly in the Low Cultural Resource Density Zone while the Bruneau-Jarbidge, Jarbidge Forks, Oregon Trail, and Salmon Falls Creek SRMAs are largely in the High Cultural Resource Density Zone. Of these, the 3,000 acre Hagerman-Owsley Bridge SRMA (comparable to the Yahoo SRMA in the action alternatives) and the upper portion of the 3,000 acre Salmon Falls Creek SRMA (smaller but comparable to the Salmon Falls Reservoir SRMA in the action alternatives) are expected to experience increased use. Focused management is expected to reduce impacts to the physical integrity and setting of important cultural resources.

Impacts from Management Specific to Alternative I

Of the seven SRMAs allocated in Alternative I, four are expected to experience a measurable increase in use. These include the Balanced Rock, Deadman/Yahoo, Little Pilgrim, and Salmon Falls Reservoir SRMAs. Overall, 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 17% of the Low Density Zone would be within SRMAs with increased use. Alternative I would increase recreation management on approximately 42,000 acres, including increased staff presence, periodic law enforcement patrol, facilities and access improvements, routine monitoring, and interpretation aimed at resource protection. Focused management is expected to reduce impacts to the physical integrity and setting of important cultural resources.

Table 4-240. Special Recreation Management Areas with Expected Increased Use by Cultural Resource Density Zone in Alternative I (Acres)

SRMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Balanced Rock SRMA	500	0	0
Deadman/Yahoo SRMA	2,000	2,000	32,000
Little Pilgrim SRMA	300	0	0
Salmon Falls Reservoir SRMA	5,000	0	0

Recreational use of the remaining SRMAs and the Extensive Recreation Management Area (ERMA) is expected to remain stable or increase slightly. Any increases would be dispersed over relatively large areas and should not result in measurable impacts at the planning area scale.

Impacts from Management Specific to Alternative II

Two of the three SRMAs designated in Alternative II, Little Pilgrim and Salmon Falls Reservoir, are expected to experience a measurable increase in use. Together, these include less than 1% of the High Cultural Resource Density Zone and none of the Moderate and Low Density Zones. Alternative II would increase recreation management on approximately 5,300 acres, including increased staff presence, periodic law enforcement patrol, facilities and access improvements, routine monitoring, and interpretation aimed at resource protection. Only Alternative V would provide focused recreation

management on fewer acres. Focused management is expected to reduce impacts to the physical integrity and setting of important cultural resources.

Table 4-241. Special Recreation Management Areas with Expected Increased Use by Cultural Resource Density Zone in Alternative II (Acres)

SRMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Little Pilgrim SRMA	300	0	0
Salmon Falls Reservoir SRMA	5,000	0	0

Recreational use is also expected to increase at the Deadman, Pasadena, and Rosevear off-highway vehicle (OHV) areas. These areas would not be included in SRMAs in Alternative V and would not receive pro-active management, thereby increasing the potential for impacts to cultural resources.

With the exception of the areas identified above, recreational use in the remainder of the SRMAs and the ERMA is expected to remain stable or increase slightly. Any increases would be dispersed over relatively large areas and should not result in measurable impacts at the planning area scale. Under this alternative, demand for OHV opportunities would be met through Recreation and Public Purposes Act lease or land exchange with non-Federal entities.

Impacts from Management Specific to Alternative III

Four of the five SRMAs designated in Alternative III are expected to experience a measurable increase in use. These include the Balanced Rock, Deadman/Yahoo, Little Pilgrim, and Salmon Falls Reservoir SRMAs. The overall percentage of areas within the High, Moderate, and Low Cultural Resource Density Zones would be essentially the same as Alternative I. Alternative III would increase recreation management on approximately 41,000 acres, including increased staff presence, periodic law enforcement patrol, facilities and access improvements, routine monitoring, and interpretation aimed at resource protection. Focused management is expected to reduce impacts to the physical integrity and setting of important cultural resources. SRMA management would be similar to Alternative I.

Table 4-242. Special Recreation Management Areas with Expected Increased Use by Cultural Resource Density Zone in Alternative III (Acres)

SRMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Balanced Rock SRMA	500	0	0
Deadman/Yahoo SRMA	2,000	2,000	31,000
Little Pilgrim SRMA	300	0	0
Salmon Falls Reservoir SRMA	5,000	0	0

Recreational use of the remaining SRMAs and the ERMA is expected to remain stable or increase slightly. Any increases would be dispersed over relatively large areas and should not result in measurable impacts at the planning area scale.

Impacts from Management Specific to Alternative IV

Two of the four SRMAs designated in Alternative IV, Deadman/Yahoo and Salmon Falls Reservoir, are expected to experience a measurable increase in use. Together these include less than 1% of the High and Moderate Cultural Resource Density Zones and approximately 17% of the Low Density Zone.

Table 4-243. Special Recreation Management Areas with Expected Increased Use by Cultural Resource Density Zone in Alternative IV (Acres)

SRMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Deadman/Yahoo SRMA	2,000	2,000	31,000
Salmon Falls Reservoir SRMA	5,000	0	0

Recreational use is expected to increase at the Little Pilgrim fishing hole. This area would not be an SRMA in Alternative IV and would not receive pro-active management, thereby increasing the potential for impacts to cultural resources. Alternative IV would increase recreation management on approximately 40,000 acres, including increased staff presence, periodic law enforcement patrol, facilities and access improvements, routine monitoring, and interpretation aimed at resource protection. Focused management is expected to reduce impacts to the physical integrity and setting of important cultural resources. SRMA management would be similar, in term of acres, to Alternative I.

With the exception of the areas identified above, recreational use of the remaining SRMAs and ERMA is expected to remain stable or increase slightly. Any increases would be dispersed over relatively large areas and should not result in measurable impacts at the planning area scale.

Impacts from Management Specific to Alternative V

Only one of the two SRMAs in Alternative V, the Yahoo SRMA, is expected to experience a measurable increase in use. The Yahoo SRMA includes less than 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 1% of the Low Density Zone.

Table 4-244. Special Recreation Management Areas with Expected Increased Use by Cultural Resource Density Zone in Alternative V (Acres)

SRMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Yahoo SRMA	1,000	500	2,000

Recreational use is expected to increase at the Little Pilgrim fishing hole; the Deadman, Pasadena, and Rosevear OHV areas; and Salmon Falls Reservoir. These areas would not be included in SRMAs in Alternative V and would not receive pro-active management, thereby increasing the potential for impacts to cultural resources. Alternative V would provide the least protection for the physical integrity and setting of cultural resources from recreation-related impacts.

With the exception of the areas identified above, recreational use of the remaining SRMAs and ERMA is expected to remain stable or increase slightly. Any increases would be dispersed over relatively large areas and should not result in measurable impacts at the planning area scale.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Five of the six SRMAs proposed in Alternative VI, Balanced Rock, Deadman, Little Pilgrim, Salmon Falls Reservoir, and Yahoo are expected to experience a measurable increase in use. In addition, two of the four proposed ERMAs, Luds Point and Rosevear, are expected to see increased use. Together these include less than 1% of the High and Moderate Cultural Resource Density Zones and approximately 17% of the Low Density Zone. Alternative VI would increase recreation management through SRMA designation on approximately 49,000 acres, including increased staff presence, periodic law enforcement patrol, facilities and access improvements, routine monitoring, and interpretation aimed at resource protection. Focused management is expected to reduce impacts to the physical integrity and setting of important cultural resources. Alternative VI would provide the most protection for cultural resources from recreation-related impacts.

Table 4-245. Special and Extensive Recreation Management Areas with Expected Increased Use by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

SRMA/ERMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Balanced Rock SRMA	500	0	0
Deadman SRMA	200	0	13,000
Little Pilgrim SRMA	300	0	0
Salmon Falls Reservoir SRMA	1,400	0	0

SRMA/ERMA	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Yahoo SRMA	1,000	500	1,700
Luds Point ERMA	3,000	0	0
Rosevear ERMA	700	900	17,300

With the exception of the areas identified above, recreational use of the remaining SRMAs and ERMA is expected to remain stable or increase slightly. Any increases would be dispersed over relatively large areas and should not result in measurable impacts at the planning area scale.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

Potential impacts to cultural resources from transportation and travel are closely linked to the size and location of areas that are open to cross-country motorized vehicle use or closed to motorized vehicle use. The effects of cross-country motorized vehicle use that diminish the physical integrity and setting of cultural resources include surface disruption of soils, compaction of surface and subsurface soils, destruction of vegetation, accelerated erosion, deflation of cultural deposits, and displacement and damage to artifacts and cultural features (Sampson, 2007). Off-site impacts to setting include long-lasting scars on the landscape and short-term noise effects during actual use.

Studies also suggest that vandalism and looting of archaeological sites is highly correlated with ease of access and degree of remoteness (Downer, 1992; Sullivan III et al., 2002). Areas open to cross-country motorized vehicle use, closed to motorized vehicle use, and limited to designated routes, and areas with reduced route densities, are the variables used to evaluate the effects of transportation and travel on cultural resources. Open areas have the highest potential to impact the physical integrity and setting of important cultural resources, and, assuming compliance and enforcement, closed areas have a very low potential for transportation and travel effects, while the use of designated routes is expected to have a low to moderate potential for travel-related impacts. Vandalism and looting of archaeological and historic sites are expected to increase in areas where route density increases.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 21% of acres in the High Density Zone would be open to cross-country motorized vehicle use, use would be limited on 70%, and 9% would be closed to motorized vehicle use. Within the Moderate Cultural Resource Density Zone, approximately 19% would be open to cross-country motorized vehicle use, use would be limited on 81%, and less than 1% would be closed to motorized vehicle use. Within the Low Cultural Resource Density Zone, 57% would be open to cross-country motorized vehicle use, use would be limited on 43%, and no areas would be closed to motorized vehicle use.

Table 4-246. Travel Designations by Cultural Resource Density Zone in No Action Alternative (Acres)

Travel Designation	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Open	141,000	95,000	106,000	**342,000**
Limited to Designated Routes	474,000	412,000	81,000	**967,000**
Closed	58,000	5,000	0	**63,000**

Travel Management Areas (TMA) are not identified in the No Action Alternative. Route density is expected to increase, along with associated impacts to the physical integrity and setting of cultural resources, in the areas open to cross-country motorized use.

The No Action Alternative would have the highest potential to impact cultural resources from management related to transportation and travel of all the alternatives.

Impacts from Management Common to All Action Alternatives

The management actions under this heading generally promote resource protection. In particular, the guidelines for future route designations in areas limited to designated routes should help maintain the physical integrity and setting of important cultural resources. While these actions would benefit cultural resources locally, they would produce no measurable effects at the landscape scale.

Impacts from Management Specific to Alternative I

Under Alternative I, less than 1% of acres in the High Cultural Resource Density Zone would be open to cross-country motorized vehicle use, use would be limited on 84%, and 16% would be closed to motorized use. Within the Moderate Cultural Resource Density Zone, no acres would be open to cross-country motorized vehicle use, use would be limited on 99%, and less than 1% would be closed to motorized vehicle use. Within the Low Cultural Resource Density Zone, 2% would be open to cross-country motorized vehicle use, use would be limited on 98%, and no acres would be closed to motorized vehicle use.

Alternative I would create five TMAs that would affect route density in the planning area (Table 4-247). Route density in the Deadman/Yahoo TMA is expected to increase. This TMA includes approximately 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 18% of the Low Density Zone.

Table 4-247. Travel Designations and Expected Change in Route Density by Cultural Resource Density Zone in Alternative I (Acres)

	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Travel Designation				
Open	300	0	3,300	**4,000**
Limited to Designated Routes	562,000	507,000	184,000	**1,253,000**
Closed	110,000	5,000	0	**115,000**
Expected Change in Route Density				
Increase	6,000	2,000	33,000	**41,000**
Decrease	380,000	131,000	154,000	**665,000**
No Change	287,000	379,000	0	**666,000**

Route densities in the Canyonlands TMA, the Jarbidge Foothills TMA, and the Snake River TMA are expected to decrease. Together, these TMAs include 57% of the High Cultural Resource Density Zone, 26% of the Moderate Density Zone, and 82% of the Low Density Zone.

Route density in the Devil Creek TMA is expected to remain stable. This TMA includes 46% of the High Cultural Resource Density Zone, 74% of the Moderate Density Zone, and none of the Low Density Zone.

Alternative I would eliminate impacts to the physical integrity and setting of important cultural resources from cross-country motorized travel on 52,000 acres more than the No Action Alternative and substantially reduce the area where impacts related to increased route density are expected.

Impacts from Management Specific to Alternative II

Under Alternative II, no acres in the High Cultural Resource Density Zone would be open to cross-country motorized vehicle use, use would be limited on 91%, and 9% would be closed to motorized vehicle use. Within the Moderate Cultural Resource Density Zone, no acres would be open, less than 1% would be closed, and over 99% would be limited. Within the Low Cultural Resource Density Zone, all 187,000 acres would be limited to designated routes.

Table 4-248. Travel Designations and Expected Change in Route Density by Cultural Resource Density Zone in Alternative II (Acres)

	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Travel Designation				
Open	0	0	0	**0**
Limited to Designated Routes	615,000	507,000	187,000	**1,309,000**
Closed	58,000	5,000	0	**63,000**
Expected Change in Route Density				
Increase	476,000	497,000	186,000	**1,159,000**
Decrease	0	0	0	**0**
No Change	197,000	15,000	1,000	**213,000**

Alternative II creates two TMAs that would affect route density in the planning area. Route density in the Bruneau Desert TMA is expected to increase. This TMA includes 71% of the High Cultural Resource Density Zone, 97% of the Moderate Density Zone, and 99% of the Low Density Zone.

Route density in the Canyonlands TMA is expected to remain the same. This TMA includes 29% of the High Cultural Resource Density Zone, 3% of the Moderate Density Zone, and less than 1% of the Low Density Zone.

Alternative II would eliminate travel-related impacts on the same acreage as the No Action Alternative but is expected to increase route density over a larger area than any of the action alternatives. An increase in the number of routes is expected to increase impacts to the physical integrity and setting of important cultural resources.

Impacts from Management Specific to Alternative III

Under Alternative III, less than 1% of acres in the High Cultural Resource Density Zone would be open to cross-country motorized vehicle use, use would be limited on 91%, and almost 9% would be closed to motorized vehicle use. Within the Moderate Cultural Resource Density Zone, no acres would be open to cross-country motorized vehicle use, use would be limited on over 99%, and less than 1% would be closed to motorized vehicle use. Within the Low Cultural Resource Density Zone, 2% would be open to cross-country motorized vehicle use, use would be limited on 98%, and no acres would be closed to motorized vehicle use.

Alternative III creates five TMAs that would affect route density in the planning area. Route density in the Deadman/Yahoo TMA is expected to increase. This TMA includes less than 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 17% of the Low Density Zone.

Table 4-249. Travel Designations and Expected Change in Route Density by Cultural Resource Density Zone in Alternative III (Acres)

	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Travel Designation				
Open	300	0	3,300	**4,000**
Limited to Designated Routes	614,000	507,000	184,000	**1,305,000**
Closed	58,000	5,000	0	**63,000**
Expected Change in Route Density				
Increase	2,000	2,000	31,000	**35,000**
Decrease	0	0	0	**0**
No Change	671,000	510,000	156,000	**1,337,000**

Route densities in the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs are expected to remain the same. These TMAs include over 99% of the High Cultural Resource Density Zone, over 99% of the Moderate Density Zone, and 83% of the Low Density Zone.

Alternative III would eliminate travel-related impacts to the physical integrity and setting of important cultural resources on the same acreage as the No Action Alternative and Alternative II, however, increases in route density are expected to occur over a substantially smaller area.

Impacts from Management Specific to Alternative IV

Under Alternative IV, less than 1% of acres in the High Cultural Resource Density Zone would be open to cross-country motorized vehicle use, use would be limited on 86%, and 13% would be closed to motorized vehicle use. Within the Moderate Cultural Resource Density Zone, no acres would be open to cross-country motorized vehicle use, use would be limited on over 98%, and less than 2% would be closed to motorized vehicle use. Within the Low Cultural Resource Density Zone, 2% would be open to cross-country motorized vehicle use, use would be limited on 98%, and no acres would be closed to motorized vehicle use.

Alternative IV creates five TMAs that would affect route density in the planning area. Route density in the Deadman/Yahoo TMA is expected to increase. This TMA includes less than 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 17% of the Low Density Zone.

Table 4-250. Travel Designations and Expected Change in Route Density by Cultural Resource Density Zone in Alternative IV (Acres)

	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Travel Designation				
Open	300	0	3,300	**4,000**
Limited to Designated Routes	582,000	503,000	184,000	**1,269,000**
Closed	91,000	8,000	0	**99,000**
Expected Change in Route Density				
Increase	2,000	2,000	31,000	**35,000**
Decrease	671,000	510,000	156,000	**1,337,000**
No Change	0	0	0	**0**

Route densities in the Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs are expected to decrease. These TMAs include over 99% of the High Cultural Resource Density Zone, over 99% of the Moderate Density Zone, and 83% of the Low Density Zone.

Alternative IV would eliminate impacts to the physical integrity and setting of important cultural resources from cross-country motorized travel on 36,000 acres more than the No Action Alternative and impacts related to increased route density would be substantially reduced in comparison to both the No Action Alternative and Alternative II.

Impacts from Management Specific to Alternative V

Under Alternative V, less than 1% of acres in the High Cultural Resource Density Zone would be open to cross-country motorized vehicle use, use would be limited on 78%, and almost 22% would be closed to motorized vehicle use. Within the Moderate Cultural Resource Density Zone, no acres would be open to cross-country motorized vehicle use, use would be limited on 96%, and 4% would be closed to motorized vehicle use. Within the Low Cultural Resource Density Zone, less than 1% would be open to cross-country motorized vehicle use, use would be limited on over 99%, and no areas would be closed to motorized vehicle use.

Alternative V creates five TMAs that would affect route density in the planning area. Route density in the Yahoo TMA is expected to increase. This TMA includes less than 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 1% of the Low Density Zone.

Table 4-251. Travel Designations and Expected Change in Route Density by Cultural Resource Density Zone in Alternative V (Acres)

	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Travel Designation				
Open	300	0	400	**1,000**
Limited to Designated Routes	525,000	494,000	186,000	**1,205,000**
Closed	148,000	18,000	0	**166,000**
Expected Change in Route Density				
Increase	1,000	500	2,000	**4,000**
Decrease	672,000	511,000	185,000	**1,368,000**
No Change	0	0	0	**0**

Route densities in the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs are expected to decrease by an unknown amount. These TMAs include over 99% of the High Cultural Resource Density Zone, over 99% of the Moderate Density Zone, and 99% of the Low Density Zone.

Alternative V would eliminate impacts to the physical integrity and setting of important cultural resources from cross-country motorized travel on 103,000 acres more than the No Action Alternative; impacts related to increased route density would be substantially reduced in comparison to all alternatives. This alternative would result in the fewest adverse impacts to cultural resources from transportation and travel management.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, less than 1% of acres in the High Cultural Resource Density Zone would be open to cross-country motorized vehicle use, use would be limited on 91%, and just under 9% would be closed to motorized vehicle use. Within the Moderate Cultural Resource Density Zone, no acres would be open to cross-country motorized vehicle use, use would be limited on over 99%, and less than 1% would be closed to motorized vehicle use. Within the Low Cultural Resource Density Zone, 2% would be open to cross-country motorized vehicle use, use would be limited on 98%, and no acres would be closed to motorized vehicle use.

Alternative VI creates five TMAs that would affect route density in the planning area. Route density in the Deadman/Yahoo TMA is expected to increase. This TMA includes less than 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 17% of the Low Density Zone.

Table 4-252. Travel Designations and Expected Change in Route Density by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

	Cultural Resource Density Zone			Total Acres
	High Density	Moderate Density	Low Density	
Travel Designation				
Open	400	0	3,300	**4,000**
Limited to Designated Routes	614,000	507,000	184,000	**1,305,000**
Closed	58,000	5,000	0	**63,000**
Expected Change in Route Density				
Increase	2,000	1,000	32,000	**35,000**
Decrease	135,000	120,000	0	**255,000**
No Change	536,000	391,000	155,000	**1,082,000**

Route densities in the Jarbidge Foothills TMA are expected to decrease. This TMA includes 20% of the High Cultural Resource Density Zone, 23% of the Moderate Density Zone, and none of the Low Density Zone. Route densities in the Canyonlands, Devil Creek, and Snake River TMAs are expected to remain the same. These TMAs include 80% of the High Cultural Resource Density Zone, over 76% of the Moderate Density Zone, and 83% of the Low Density Zone.

Alternative VI would eliminate travel-related impacts to the physical integrity and setting of important cultural resources on the same acreage as the No Action Alternative and Alternative II, however, increases in route density are expected to occur over a substantially smaller area. Impacts to cultural resources from transportation and travel management would be the same as under Alternative III.

Impacts from Land Use Authorization Actions

The following indicators were used to analyze the impacts of Land Use Authorization actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

Land use authorizations are subject to review under the National Environmental Policy Act (NEPA) and the National Historic Preservation Act, Section 106; however, an increasing demand for rights-of-ways (ROWs) increases the potential for impacts to the physical integrity and setting of important cultural resources. Large development projects (e.g., major power lines) typically disturb larger areas and are more difficult to reroute or adjust to avoid cultural resources. Standard archaeological mitigation measures (e.g., excavation, controlled collection), while an important option, still result in some loss of archaeological data and could diminish tribal connections to sites of traditional cultural importance. ROW exclusion areas reduce potential damage to the physical integrity and setting of cultural resources from development impacts. In contrast, identified utility ROW corridors and wind energy development areas are expected to be fully developed, thereby increasing the potential to impact cultural resources.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative identifies 95,000 acres with restrictions on ROWs for overhead, surface, and underground facilities. These include 13% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and less than 1% of the Low Density Zone. Although not directly comparable, this category most closely resembles the ROW exclusion allocations in the action alternatives. Cultural resources in these areas would suffer no loss of physical integrity and setting from land use

authorizations. Under the No Action Alternative, 30,000 acres would be designated as utility ROW corridors. The areas include 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 11% of the Low Density Zone. Construction-related surface disturbance and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources within the ROW corridors and the surrounding viewshed.

Under the No Action Alternative, 111,000 acres would be within expected wind energy development areas. These areas include 11% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and 18% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources.

Table 4-253. Right-of-Way Corridors and Expected Wind Energy Development Areas by Cultural Resource Density Zone in the No Action Alternative (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	5,000	3,000	21,000
Expected Wind Development	72,000	6,000	33,000

Impacts from Management Common to All Action Alternatives

The management actions under this heading generally promote resource protection. In particular, the guidelines for co-locating future communications sites with existing towers and placing new ROWs in previously disturbed locations should help maintain the physical integrity and setting of important cultural resources. While these actions would benefit cultural resources locally, they would produce no measurable effects at the planning area scale.

Impacts from Management Specific to Alternative I

Under Alternative I, 63,000 acres would be excluded from consideration for ROWs, including 9% of the High Cultural Resource Density Zone, just under 1% of the Moderate Density Zone, and less than 1% of the Low Density Zone. Cultural resources in these areas would suffer no loss of physical integrity or setting from land use authorizations. Alternative I would eliminate impacts from ROWs on 32,000 fewer acres than the No Action Alternative.

Under Alternative I, 53,000 acres would be designated as utility ROW corridors. These areas include 3% of the High Cultural Resource Density Zone, 2% of the Moderate Density Zone, and 11% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources within the ROW corridors and the surrounding viewshed. Alternative I would designate 23,000 more acres for utility ROW development than the No Action Alternative.

Under Alternative I, 39,000 acres would be within expected wind energy development areas. These areas include 2% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 12% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources. Wind energy developments are expected on 72,000 fewer acres than under the No Action Alternative.

Table 4-254. Right-of-Way Corridors and Expected Wind Energy Development Areas by Cultural Resource Density Zone in Alternative I (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	23,000	9,000	21,000
Expected Wind Development	13,000	4,000	23,000

Impacts from Management Specific to Alternative II

Under this alternative, 62,000 acres would be excluded from consideration for ROWs. This area includes 9% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and none of the Low Density Zone. Cultural resources in these areas would suffer no loss of physical integrity or setting due to land use authorizations. Alternative II would eliminate impacts from ROWs on 33,000 fewer acres than the No Action Alternative.

Alternative II would designate the same ROW corridors as Alternative I.

Under Alternative II, 127,000 acres would be within expected wind energy development areas. These areas include 14% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and 16% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources. Wind energy developments are expected on 16,000 acres more than under the No Action Alternative.

Table 4-255. Right-of-Way Corridors and Expected Wind Energy Development Areas by Cultural Resource Density Zone in Alternative II (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	23,000	9,000	21,000
Expected Wind Development	91,000	7,000	29,000

Impacts from Management Specific to Alternative III

Under this alternative, 63,000 acres would be excluded from consideration for ROWs. The acres excluded in each Cultural Resource Density Zone would be the same as Alternative I. Cultural resources in these areas would suffer no loss of physical integrity or setting due to land use authorizations. Alternative III would eliminate impacts from ROWs on 32,000 fewer acres than the No Action Alternative.

Alternative III would designate the same ROW corridors as Alternative I.

Under Alternative III, 50,000 acres would be within expected wind energy development areas. These areas include 4% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 12% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources. Wind energy developments are expected on 61,000 fewer acres than under the No Action Alternative.

Table 4-256. Right-of-Way Corridors and Expected Wind Energy Development Areas by Cultural Resource Density Zone in Alternative III (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	23,000	9,000	21,000
Expected Wind Development	24,000	3,000	23,000

Impacts from Management Specific to Alternative IV

Under this alternative, 100,000 acres would be excluded from consideration for ROWs. This area includes 14% of the High Cultural Resource Density Zone, 2% of the Moderate Density Zone, and less than 0.01% of the Low Density Zone. Cultural resources in these areas would suffer no loss of physical integrity or setting due to land use authorizations. Alternative IV would eliminate impacts from ROWs on 5,000 more acres than the No Action Alternative.

Alternative IV would designate the same ROW corridors as Alternative I.

Under Alternative IV, 37,000 acres would be within expected wind energy development areas. These areas include 2% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 12% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources. Wind energy developments are expected on 74,000 fewer acres than under the No Action Alternative.

Table 4-257. Right-of-Way Corridors and Expected Wind Energy Development Areas by Cultural Resource Density Zone in Alternative IV (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	23,000	9,000	21,000
Expected Wind Development	14,000	1,000	22,000

Impacts from Management Specific to Alternative V

Under this alternative, 167,000 acres would be excluded from consideration for ROWs. This area includes 22% of the High Cultural Resource Density Zone, 3% of the Moderate Density Zone, and less than 0.01% of the Low Density Zone. Cultural resources in these areas would suffer no loss of physical integrity or setting due to land use authorizations. Alternative V would eliminate impacts from ROWs on 72,000 more acres than the No Action Alternative.

Alternative V would designate the same ROW corridors as Alternative I.

Under Alternative V, 32,000 acres would be within expected wind energy development areas. These areas include less than 2% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 12% of the Low Density Zone. Construction-related surface disturbance from this development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources. Wind energy developments are expected on 79,000 fewer acres than under the No Action Alternative.

Table 4-258. Right-of-Way Corridors and Expected Energy Wind Development Areas by Cultural Resource Density Zone in Alternative V (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	23,000	9,000	21,000
Expected Wind Development	9,000	1,000	22,000

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under this alternative, 63,000 acres would be excluded from consideration for ROWs. The acres excluded in each Cultural Resource Density Zone would be the same as Alternatives I and III. Cultural resources in these areas would suffer no loss of physical integrity or setting due to land use authorizations. Alternative VI would eliminate impacts from ROWs on 32,000 fewer acres than the No Action Alternative.

Under Alternative VI, 43,000 acres would be designated as utility ROW corridors. These areas include 3% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 16% of the Low Density Zone. Construction-related surface disturbance and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources within the utility development areas. Alternative VI would designate 13,000 more acres for utility ROW development than the No Action Alternative.

Under Alternative VI, 22,000 acres would be within expected wind energy development areas. These areas include less than 1% of the High Cultural Resource Density Zone, less than 1% of the Moderate Density Zone, and 8% of the Low Density Zone. Construction-related surface disturbance from this

development and the addition of new structures would increase the potential to impact the physical integrity and setting of cultural resources. Wind energy developments are expected on 89,000 fewer acres than under the No Action Alternative.

Table 4-259. Right-of-Way Corridors and Expected Wind Energy Development Areas by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

Type of Development	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
ROW Corridors	9,000	5,000	29,000
Expected Wind Development	6,000	2,000	14,000

Impacts from Minerals Actions

The following indicators were used to analyze the impacts of Mineral actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

The development of leasable, salable, and locatable minerals has the potential to impact the physical integrity and setting of cultural resources through surface and subsurface disturbance related to extraction activities and associated infrastructure. Mineral extraction may require earth moving, tunneling, blasting, drilling, road construction, or other surface-disturbing actions, all of which could damage or destroy cultural resources.

Leasable minerals include energy resources such as oil, gas, and geothermal waters. An assessment of oil and gas development potential indicates an area of 307,000 acres of BLM-managed surface in the planning area have potential for oil and gas leasing. Of these, 45% are in the High Cultural Resource Density Zone, 9% are in the Moderate Density Zone, and 46% are in the Low Density Zone. The Reasonably Foreseeable Development Scenario (RFDS) for oil and gas development assumes that 10 to 20 leases may be offered over the next 20 years, resulting in two to three geophysical exploration programs and one to two exploration wells. Total surface disturbance associated with oil and gas development is estimated at 90 acres (Appendix K).

Geothermal resources may also be present beneath the Snake River Plain in the northern portion of the planning area. Approximately 9,000 acres have a high potential for geothermal leasing and another 357,000 acres have medium potential for leasing. The remaining 1,005,000 acres in the planning area have low potential. Geothermal extraction would require the drilling of deep wells and the construction of power plants to convert the geothermal steam to electricity. New roads and powerlines may also be required. The RFDS for geothermal development assumes that 20 megawatts of power would be developed over the life of the plan. Total surface disturbance associated with geothermal development is estimated at 185 to 230 acres (Appendix L).

With the current focus on developing new sources of domestic energy, future oil and gas and geothermal developments in the planning area are possibilities to consider. For this analysis, the areas closed to leasable mineral development, combined with the areas open for leasing but with no surface occupancy (NSO) restrictions, are compared to the High, Moderate, and Low Cultural Resource Density Zones. Alternatives with the most lands open to development in the High and Moderate Cultural Resource Density Zones would have the greatest potential to impact the physical integrity or setting of cultural resources while those with the most areas closed to mineral leasing or open with NSO restrictions in the High and Moderate Cultural Resource Density Zones would offer the most protection from impacts.

Salable minerals include sand, gravel, and decorative stone. The extraction of sand and gravel requires intensive surface and subsurface ground disturbance which could impact the physical integrity of cultural resources, especially buried sites. The removal of decorative stone could disturb Native American hunting blinds, or other features associated with talus slopes. To evaluate the potential effects of salable mineral management allocations and actions, the areas available and closed to salable mineral development in

each alternative are compared to the High, Moderate, and Low Cultural Resource Density Zones. Alternatives with the most acres open to salable mineral development within the High and Moderate Cultural Resource Density Zones have the greatest potential to impact the physical integrity or setting of cultural resources while those with the most acres closed to mineral sales in the High and Moderate Zones would offer the most protection for cultural resources. Even though most of the planning area would be open to salable mineral development in all of the alternatives, the BLM estimates between 1,000 and 2,000 acres of new development would be added to the existing 1,300 acres under permit over the life of the plan. Proposals for new material pits would be subject to NEPA analysis, tribal consultation, National Historic Preservation Act Section 106 compliance, and, at a minimum, standard resource protection stipulations.

Locatable minerals include gold, silver, other metals, some gemstones and other rare minerals with commercial or industrial value. Locatable mineral development usually involves destructive extraction methods, e.g., blasting, trenching, tunneling, or large scale earth moving. Unlike leasable and salable minerals, locatable mineral exploration and development are not discretionary BLM actions. Surface-disturbing actions would be subject to the unnecessary or undue degradation standard required by the Federal Land Policy and Management Act of 1976 and the performance standards found at 43 CFR 3809.420. Although no large, economically viable locatable mineral deposits have been found in the planning area, a few mining claims are active along the Bruneau River, Salmon Falls Creek, and the Snake River. Even though the potential for development is low, in the absence of protective restrictions, cultural resources are at risk from mineral exploration. In the past, several terraces along the Snake River, including the one at Sand Point, were subjected to destructive but commercially unproductive mining activity. In order to assess the potential impacts to cultural resources from locatable mineral actions, the areas recommended for withdrawal from the mining laws are compared to the Cultural Resource Density Zones. For purposes of analysis, it is assumed that withdrawal requests will be granted. Alternatives with the most acres withdrawn from locatable mineral entry in the High and Moderate Cultural Resource Density Zones would have the least potential to impact cultural resources.

Impacts from Management Specific to the No Action Alternative

Most of the planning area would be open to mineral leasing under the No Action Alternative. An NSO restriction would apply to the Oregon National Historic Trail, the cultural resource complexes, wilderness, the Wilderness Study Area, and riparian areas. This restriction would reduce impacts related to oil and gas or geothermal development on surface artifacts and features. For the planning area as a whole, the No Action Alternative would make 204,000 acres of the Federal mineral estate unavailable for mineral leasing, including 3,000 acres in the potential oil and gas areas and 64,000 acres in the potential geothermal areas. An additional 140,000 acres would be available under an NSO restriction, including 22,000 acres in the potential oil and gas areas and 41,000 acres in the potential geothermal areas. According to the RFDS for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. Similarly, according to the RFDS for geothermal development (Appendix L), between 185 and 230 acres of surface disturbance are expected to occur in the planning area as a result of geothermal exploration and development over the life of the plan. This is less than 0.1% of the potential geothermal areas that would be available for geothermal leasing.

Under the No Action Alternative, approximately 1,300 acres would continue to be managed for material use sites. New sites for salable mineral development would be considered, as needed, throughout the planning area. This alternative would make more land susceptible to impacts from salable mineral development than any of the alternatives. An additional 1,000 acres of salable mineral development is expected under the No Action Alternative.

Under the No Action Alternative, 63,000 acres would continue to be withdrawn from the general mining laws while an additional 158,000 acres would be recommended for withdrawal. This alternative would make less area susceptible to impacts from locatable mineral development than any of the alternatives. Demand for locatable minerals in the planning area is not expected to change from present levels; thus,

the potential for impacts to the physical integrity and setting of cultural resources to occur over the life of the plan is low.

Impacts from Management Common to All Action Alternatives

The standard cultural resource protection stipulation attached to each lease would ensure thorough consideration of cultural resources prior to any surface-disturbing activities. Terms and conditions for commercial development of salable mineral sites, under all action alternatives, would contain a prohibition on disturbing important cultural resources.

Impacts from Management Specific to Alternative I

Alternative I would eliminate or reduce impacts to the physical integrity and setting of cultural resources from oil and gas development on 9% of the potential oil and gas areas through administrative closure or NSO restrictions. These same restrictions would apply to 8% of the high and medium potential geothermal areas. Based on the RFDS for oil and gas and geothermal resources, less than 0.1% of the potential oil and gas areas and geothermal areas that are available for leasing are expected to be developed.

This alternative would make 24% of the High Cultural Resource Density Zone, 2% of the Moderate Density Zone, and 1% of the Low Density Zone unavailable for salable mineral development. For the planning area as a whole, 13% of BLM surface estate would be closed to mineral sales and 87% would be open. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development.

Under Alternative I, 69,000 acres of BLM surface estate would be recommended for withdrawal from the general mining laws. This area includes 9% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and less than 1% of the Low Density Zone. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Table 4-260. Mineral Allocations by Cultural Resource Density Zone in Alternative I (Acres)

Mineral Allocation	Cultural Resource Density Zone		
	High Density	**Moderate Density**	**Low Density**
Leasable Minerals			
Oil and Gas [A]			
Open or Open with Restrictions [B]	109,000	28,000	140,000
Closed or Open with No Surface Occupancy	29,000	10	1,000
Geothermal [C]			
Open or Open with Restrictions[B]	31,000	119,000	185,000
Closed or Open with No Surface Occupancy	28,000	400	2,000
Salable Minerals			
Open	512,000	502,000	186,000
Closed	161,000	10,000	1,000
Locatable Mineral			
Recommended for Withdrawal	63,000	5,000	1,000

[A] Includes only acres within the potential oil and gas development areas.
[B] Includes open, open with seasonal restrictions, and open with controlled surface use restrictions. These designations offer less protection from surface disturbance than NSO, and therefore, increased potential to impact cultural resources.
[C] Includes only acres within the high and medium potential geothermal development areas.

Impacts from Management Specific to Alternative II

Alternative II would eliminate or reduce impacts to the physical integrity and setting of cultural resources from oil and gas development on 5% of the potential oil and gas areas through administrative closure or

NSO restrictions. These same restrictions would apply to 4% of the high and medium potential geothermal areas. However, as in Alternative I, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed.

This alternative would make 13% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and less than 1% of the Low Density Zone unavailable for salable mineral development. For the planning area as a whole, 7% of BLM surface estate would be closed to mineral sales and 93% would be open. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 3,300 acres over the life of the plan. This is approximately 0.3% of the area available for salable mineral development.

Under Alternative II, 26,000 acres of BLM surface estate would be recommended for withdrawal from the general mining laws. This area includes 4% of the High Cultural Resource Density Zone. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Table 4-261. Mineral Allocations by Cultural Resource Density Zone in Alternative II (Acres)

Mineral Allocation	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Leasable Minerals			
Oil and Gas [A]			
Open or Open with Restrictions[B]	124,000	28,000	140,000
Closed or Open with No Surface Occupancy	14,000	0	0
Geothermal [C]			
Open or Open with Restrictions[B]	46,000	120,000	187,000
Closed or Open with No Surface Occupancy	13,000	0	10
Salable Minerals			
Open	588,000	507,000	187,000
Closed	85,000	5,000	10
Locatable Mineral			
Recommended for Withdrawal	26,000	0	0

[A] Includes only acres within the potential oil and gas development areas.
[B] Includes open, open with seasonal restrictions, and open with controlled surface use restrictions. These designations offer less protection from surface disturbance than NSO, and therefore, increased potential to impact cultural resources.
[C] Includes only acres within the high and medium potential geothermal development areas.

Impacts from Management Specific to Alternative III

Alternative III would eliminate or reduce impacts to the physical integrity and setting of cultural resources from oil and gas development on 5% of the potential oil and gas areas through administrative closure or NSO restrictions. These same restrictions would apply to 4% of the high and medium potential geothermal areas. However, as in Alternative I, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed.

This alternative would make 15% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and less than 1% of the Low Density Zone unavailable for salable mineral development. For the planning area as a whole, 8% of BLM surface estate would be closed to mineral sales and 92% would be open. Salable mineral development is expected to occur on the same number of acres as in Alternative II.

Under Alternative III, just over 28,000 acres of BLM surface estate would be recommended for withdrawal from the general mining laws. This area includes 4% of the High Cultural Resource Density Zone, less than 0.04% of the Moderate Density Zone, and less than 0.01% of the Low Density Zone. However,

demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Table 4-262. Mineral Allocations by Cultural Resource Density Zone in Alternative III (Acres)

Mineral Allocation	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Leasable Minerals			
Oil and Gas [A]			
Open or Open with Restrictions[B]	124,000	28,000	141,000
Closed or Open with No Surface Occupancy	15,000	0	10
Geothermal [C]			
Open or Open with Restrictions[B]	46,000	120,000	187,000
Closed or Open with No Surface Occupancy	14,000	0	10
Salable Minerals			
Open	572,000	507,000	187,000
Closed	101,000	5,000	10
Locatable Minerals			
Recommended for Withdrawal	28,000	200	10

[A] Includes only acres within the potential oil and gas development areas.
[B] Includes open, open with seasonal restrictions, and open with controlled surface use restrictions. These designations offer less protection from surface disturbance than NSO, and therefore, increased potential to impact cultural resources.
[C] Includes only acres within the high and medium potential geothermal development areas.

Impacts from Management Specific to Alternative IV

Alternative IV would eliminate or reduce impacts to the physical integrity and setting of cultural resources from oil and gas development on 17% of the potential oil and gas areas through administrative closure or NSO restrictions. These same restrictions would apply to 7% of the high and medium potential geothermal areas. However, as in Alternative I, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed.

This alternative would make 33% of the High Cultural Resource Density Zone, 9% of the Moderate Density Zone, and less than 1% of the Low Density Zone unavailable for salable mineral development. For the planning area as a whole, 20% of BLM surface estate would be closed to mineral sales and 80% would be open. Salable mineral development is expected to occur on the same number of acres as in Alternative I.

Under Alternative IV, almost 83,000 acres of BLM surface estate would be recommended for withdrawal from the general mining laws. This area includes 11% of the High Cultural Resource Density Zone, 2% of the Moderate Density Zone, and less than 1% of the Low Density Zone. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Table 4-263. Mineral Allocations by Cultural Resource Density Zone in Alternative IV (Acres)

Mineral Allocation	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Leasable Minerals			
Oil and Gas [A]			
Open or Open with Restrictions[B]	85,000	28,000	141,000
Closed or Open with No Surface Occupancy	53,000	0	20
Geothermal [C]			
Open or Open with Restrictions[B]	37,000	119,000	186,000

Mineral Allocation	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Leasable Minerals			
Geothermal [C]			
Closed or Open with No Surface Occupancy	23,000	400	1,000
Salable Minerals			
Open	452,000	466,000	186,000
Closed	221,000	46,000	1,000
Locatable Minerals			
Recommended for Withdrawal	74,000	8,000	1,000

[A] Includes only acres within the potential oil and gas development areas.
[B] Includes open, open with seasonal restrictions, and open with controlled surface use restrictions. These designations offer less protection from surface disturbance than NSO, and therefore, increased potential to impact cultural resources.
[C] Includes only acres within the high and medium potential geothermal development areas.

Impacts from Management Specific to Alternative V

Alternative V would eliminate or reduce impacts to the physical integrity and setting of cultural resources from oil and gas development on 20% of the potential oil and gas areas through administrative closure or NSO restrictions. These same restrictions would apply to 8% of the high and medium potential geothermal areas. However, as in Alternative I, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed.

This alternative would make 28% of the High Cultural Resource Density Zone, 4% of the Moderate Density Zone, and less than 1% of the Low Density Zone unavailable for salable mineral development. For the planning area as a whole, 15% of BLM surface estate would be closed to mineral sales and 85% would be open. Salable mineral development is expected to occur on the same number of acres as in Alternative I.

Under Alternative V, 33,000 acres of BLM surface estate would be recommended for withdrawal from the general mining laws. This area includes 5% of the High Cultural Resource Density Zone, none of the Moderate Density Zone, and less than 1% of the Low Density Zone. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Table 4-264. Mineral Allocations by Cultural Resource Density Zone in Alternative V (Acres)

Mineral Allocation	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Leasable Minerals			
Oil and Gas [A]			
Open or Open with Restrictions[B]	80,000	28,000	140,000
Closed or Open with No Surface Occupancy	59,000	0	1,000
Geothermal [C]			
Open or Open with Restrictions[B]	33,000	120,000	185,000
Closed or Open with No Surface Occupancy	27,000	10	1,000
Salable Minerals			
Open	483,000	494,000	186,000
Closed	190,000	18,000	1,000
Locatable Minerals			
Recommended for Withdrawal	32,000	0	1,000

[A] Includes only acres within the potential oil and gas development areas.

[B] Includes open, open with seasonal restrictions, and open with controlled surface use restrictions. These designations offer less protection from surface disturbance than NSO, and therefore, increased potential to impact cultural resources.
[C] Includes only acres within the high and medium potential geothermal development areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would eliminate or reduce impacts to the physical integrity and setting of cultural resources from oil and gas development on 8% of the potential oil and gas areas through administrative closure or NSO restrictions. These same restrictions would apply to 6% of the high and medium potential geothermal areas. However, as in Alternative I, less than 0.1% of the potential oil and gas areas and potential geothermal areas that are available for leasing are expected to be developed.

This alternative would make 17% of the High Cultural Resource Density Zone, 1% of the Moderate Density Zone, and less than 1% of the Low Density Zone unavailable for salable mineral development. For the planning area as a whole, 9% of BLM surface estate would be closed to mineral sales and 91% would be open. Salable mineral development is expected to occur on the same number of acres as in Alternative I.

Under Alternative VI, no areas would be recommended for withdrawal from the general mining laws. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Table 4-265. Mineral Allocations by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

Mineral Allocation	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Leasable Minerals			
Oil and Gas [A]			
Open or Open with Restrictions[B]	114,000	28,000	141,000
Closed or Open with No Surface Occupancy	24,000	0	20
Geothermal [C]			
Open or Open with Restrictions[B]	38,000	120,000	186,000
Closed or Open with No Surface Occupancy	22,000	10	500
Salable Minerals			
Open	557,000	507,000	186,000
Closed	116,000	5,000	500
Locatable Minerals			
Recommended for Withdrawal	0	0	0

[A] Includes only acres within the potential oil and gas development areas.
[B] Includes open, open with seasonal restrictions, and open with controlled surface use restrictions. These designations offer less protection from surface disturbance than NSO, and therefore, increased potential to impact cultural resources.
[C] Includes only acres within the high and medium potential geothermal development areas.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions to cultural resources:

- The physical integrity of important cultural resources and
- The setting of cultural resources.

Cultural resources are relevant and important values for five nominated ACECs: Bruneau-Jarbidge, Jarbidge Foothills, Sagebrush Sea, Sand Point, and Upper Bruneau Canyon. Each of these special designations includes management actions that would reduce impacts to cultural resources from

development and deterioration. Designation of these ACECs helps preserve the physical integrity and setting of cultural resources through pro-active management, while a decision not to designate would remove special protective management actions. While non-designation would not automatically result in impacts to relevant and important cultural values, it would also not provide added protection for these fragile resources.

Note: The Bruneau-Jarbidge ACEC as nominated in the No Action Alternative and Alternatives I, III, and IV, as well as the Sagebrush Sea ACEC nominated in Alternative V, overlaps with the Bruneau-Jarbidge Rivers Wilderness Area. The special management measures described in this section would apply only to those acres outside of the designated wilderness. More restrictive measures would apply within the wilderness.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the Bruneau-Jarbidge and Sand Point ACECs would continue to be managed for their relevant and important cultural resource values.

Management actions expected to reduce impacts to the physical integrity and setting of important cultural resources in the Bruneau-Jarbidge ACEC (85,000 acres total; 25,000 acres outside of designated wilderness) include:

- Recommended withdrawal from locatable mineral development,
- No surface occupancy (NSO) restrictions for leasable minerals,
- Management as Visual Resource Management (VRM) Class I or II, and
- Restrictions on utility rights-of-way (ROWs).

Of the total acres in the Bruneau-Jarbidge ACEC under the No Action Alternative, over 91% are in the High Cultural Resource Density Zone, 8% are in the Moderate Density Zone, and less than 1% is in the Low Density Zone.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sand Point ACEC (800 acres) include:

- Recommended withdrawal from locatable mineral development,
- NSO restrictions for leasable minerals,
- Restrictions on surface-disturbing activities,
- Restrictions on utility ROWs, and
- Motorized vehicle use limited to designated routes.

Of the total acres in this ACEC, 99% are in the High Cultural Resource Density Zone, none are in the Moderate Density Zone, and 1% is in the Low Density Zone.

The No Action Alternative would provide special ACEC management for cultural resources on 26,000 acres outside of wilderness.

Table 4-266. Areas of Critical Environmental Concern by Cultural Resource Density Zone in the No Action Alternative (Acres)

ACEC	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Bruneau-Jarbidge ACEC	78,000	7,000	400
Sand Point ACEC	800	0	10

Impacts from Management Specific to Alternative I

Under Alternative I, the Bruneau-Jarbidge and Sand Point ACECs would be managed for their relevant and important cultural resource values.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Bruneau-Jarbidge ACEC (85,000 acres; 25,000 acres outside of designated wilderness) include:

- Recommended withdrawal from locatable mineral development,
- Closure to leasable and salable mineral development,
- Management as VRM Class I, except for an existing powerline corridor that would be in VRM Class III,
- Restrictions on ROWs,
- Management as a critical suppression area, and
- Use of minimum impact suppression tactics (MIST) during fire suppression operations.

Of the total acres in the Bruneau-Jarbidge ACEC under Alternative I, over 91% are in the High Cultural Resource Density Zone, 8% are in the Moderate Density Zone, and less than 1% is in the Low Density Zone. The area protected by special ACEC management would be the same as the No Action Alternative.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sand Point ACEC (1,000 acres) include:

- Recommended withdrawal from locatable mineral development,
- Closure to leasable and salable mineral development,
- Restrictions on surface-disturbing activities including exclusion from ROWs and limitations on grazing facilities,
- Management as Land Tenure Zone 1, and
- Use of MIST during fire suppression operations.

Of the total acres in this ACEC in Alternative I, over 99% are in the High Cultural Resource Density Zone, none are in the Moderate Density Zone, and less than 1% is in the Low Density Zone. The area protected by special ACEC management would increase by 200 acres compared to the No Action Alternative.

Alternative I would increase the area protected by special ACEC management outside of wilderness by 200 acres compared to the No Action Alternative.

Table 4-267. Areas of Critical Environmental Concern by Cultural Resource Density Zone in Alternative I (Acres)

ACEC	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Bruneau-Jarbidge ACEC	78,000	7,000	400
Sand Point ACEC	1,000	0	10

Impacts from Management Specific to Alternative II

No ACECs would be designated under this alternative. Those protective measures solely related to ACEC management would not be enacted.

Impacts from Management Specific to Alternative III

Under Alternative III, the Bruneau-Jarbidge and Sand Point ACECs would be managed for their relevant and important cultural resource values.

A smaller version of the Bruneau-Jarbidge ACEC, consisting of 57,000 acres, is nominated in Alternative III. This ACEC is entirely within the Bruneau-Jarbidge Rivers Wilderness and would be managed for both wilderness and cultural resource values.

Of the total acres in the Bruneau-Jarbidge ACEC under Alternative III, 91% are in the High Cultural Resource Density Zone, 9% are in the Moderate Density Zone, and none are in the Low Density Zone.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sand Point ACEC would be the same as in Alternative I. Of the total acres in this ACEC in Alternative III, over 99% are in the High Cultural Resource Density Zone, none are in the Moderate Density Zone, and less than 1% is in the Low Density Zone.

Alternative III would decrease the area protected by special ACEC management outside of wilderness by 25,000 acres compared to the No Action Alternative.

Table 4-268. Areas of Critical Environmental Concern by Cultural Resource Density Zone in Alternative III (Acres)

ACEC	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Bruneau-Jarbidge ACEC	52,000	5,000	0
Sand Point ACEC	1,000	0	10

Impacts from Management Specific to Alternative IV

Under Alternative IV, the Bruneau-Jarbidge, Jarbidge Foothills, and Sand Point ACECs would be managed for their relevant and important cultural resource values.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Bruneau-Jarbidge ACEC (123,000 total acres; 63,000 acres outside designated wilderness) include:

- Recommended withdrawal from locatable mineral development,
- Closure to leasable and salable mineral development,
- Management as VRM Class I, except for an existing powerline corridor that would be in VRM Class III
- Restrictions on ROWs,
- Management as a critical suppression area, and
- Use of MIST during fire suppression operations.

Of the total acres in the Bruneau-Jarbidge ACEC under Alternative IV, 89% are in the High Cultural Resource Density Zone, 10% are in the Moderate Density Zone, and 1% is in the Low Density Zone. The area protected by special ACEC management (outside designated wilderness) would increase by 38,000 acres compared to the No Action Alternative.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sand Point ACEC would be the same as in Alternative I. Of the total acres in this ACEC in Alternative IV, over 99% are in the High Cultural Resource Density Zone, none are in the Moderate Density Zone, and less than 1% is in the Low Density Zone.

Table 4-269. Areas of Critical Environmental Concern by Cultural Resource Density Zone in Alternative IV (Acres)

ACEC		Cultural Resource Density Zone		
		High Density	Moderate Density	Low Density
Bruneau-Jarbidge ACEC		110,000	12,000	1,000
Jarbidge Foothills ACEC	Alternative IV-A	134,000	0	0
	Alternative IV-B	64,000	0	0
Sand Point ACEC		1,000	0	10

Management actions expected to protect the physical integrity and setting of important cultural resources in the Jarbidge Foothills ACEC include:

- A reduction in transportation route density,

- Management as a critical suppression area,
- Limits on surface disturbing activities, and
- Pro-active cultural resource monitoring and patrol.

Alternative IV-A manages 134,000 acres as the Jarbidge Foothills ACEC, while Alternative IV-B manages 64,000 acres as the Jarbidge Foothills ACEC; all acres in the ACEC are in the High Cultural Density Zone.

Alternative IV-A would increase the area protected by special ACEC management outside of wilderness by 172,000 acres compared to the No Action Alternative. Alternative IV-B would increase the area protected by special ACEC management outside of wilderness by 102,000 acres compared to the No Action Alternative. Only Alternative V would provide more protection for cultural resources through special ACEC management.

Impacts from Management Specific to Alternative V

Under Alternative V, the Sagebrush Sea and Sand Point ACECs would be managed to protect their relevant and important cultural resource values.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sagebrush Sea ACEC (956,000 total acres; 896,000 outside designated wilderness) include:

- Restrictions on ROWs,
- Management as a critical suppression area,
- Reduced transportation route density,
- Reduced grazing utilization levels, and
- Limits on surface disturbance in culturally sensitive areas.

Of the total acres in the Sagebrush Sea ACEC, 64% are in the High Cultural Resource Density Zone, 36% are in the Moderate Density Zone, and none are in the Low Density Zone. Notable concentrations of relevant and important cultural resources occur on approximately 21% (204,000 acres) of the ACEC. All of these acres are in the High Cultural Resource Density Zone.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sand Point ACEC would be the same as in Alternative I, except the ACEC would be closed to livestock grazing. Of the total acres in this ACEC in Alternative V, over 99% are in the High Cultural Resource Density Zone, none are in the Moderate Density Zone, and less than 1% is in the Low Density Zone.

Alternative V would increase the area protected by special ACEC management by 871,000 acres (outside of wilderness) compared to the No Action Alternative.

Table 4-270. Areas of Critical Environmental Concern by Cultural Resource Density Zone in Alternative V (Acres)

ACEC	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Sagebrush Sea ACEC	612,000	344,000	0
Sand Point ACEC	1,000	0	10

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, the Upper Bruneau Canyon and Sand Point ACECs would be managed for their relevant and important cultural resource values.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Upper Bruneau Canyon ACEC (18,000) include:

- Closure to leasable and salable mineral development,
- Management as VRM Class I,
- Restrictions on ROWs,
- Management as a critical suppression area,
- Use of MIST during fire suppression operations, and
- Management as Land Tenure Zone 1.

Of the total acres in the Upper Bruneau Canyon ACEC under Alternative VI, all 18,000 are in the High Cultural Resource Density Zone. The area protected by special ACEC management would decrease by 7,000 acres compared to the existing Bruneau-Jarbidge ACEC (outside of designated wilderness) in the No Action Alternative.

Management actions expected to protect the physical integrity and setting of important cultural resources in the Sand Point ACEC would be the same as in Alternative I. Of the total acres in this ACEC in Alternative VI, over 99% are in the High Cultural Resource Density Zone, none are in the Moderate Density Zone, and less than 1% is in the Low Density Zone.

Alternative VI would decrease the area protected by special ACEC management (outside of wilderness) by 7,000 acres compared to the No Action Alternative.

Table 4-271. Areas of Critical Environmental Concern by Cultural Resource Density Zone in Alternative VI (Proposed RMP) (Acres)

ACEC	Cultural Resource Density Zone		
	High Density	Moderate Density	Low Density
Upper Bruneau Canyon ACEC	18,000	0	0
Sand Point ACEC	1,000	0	10

Summary of Direct and Indirect Impacts

The alternatives contain a variety of allocations and management actions that could impact the physical integrity and setting of important cultural resources and their settings. Table 4-272 summarizes the effects of the alternatives on lands in the High and Moderate Cultural Resource Density Zones. The summary comparison is limited to the High and Moderate Zones because management actions in those zones have the highest potential to impact cultural resources. The Low Density Zone comprises less than 14% of the planning area, and the data associated with this zone do not affect the outcome of the analysis.

In the summary impact assessments below the terms minor and moderate are used in the context of the entire planning area. Minor adverse impacts are expected where activities and uses which are known to damage or destroy the physical integrity or setting of important cultural resources are spatially restricted and when use levels are similar to, or below, existing authorized levels. Minor impacts would generally be localized and reduced through project specific mitigation. Moderate adverse impacts are expected where activities and uses known to damage or destroy important cultural resources are allowed over extensive areas and when use levels substantially exceed previously authorized levels. At the moderate level, impacts to cultural resources would be more numerous and widespread. None of the alternatives are expected to result in major impacts at the planning area scale. Major impacts would be expected if unrestricted and unmitigated development and use were allowed to occur area-wide. All alternatives specify allocations and actions to protect important cultural resources and compliance with existing laws would, at a minimum, prevent major area-wide impacts from occurring.

Table 4-272. Impact Susceptibility in the High and Moderate Cultural Resource Density Zones (Acres)

Impact Susceptibility	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Wildland Fire Ecology and Management								
High [A]	1,185,000	723,000	1,044,000	738,000	621,000	663,000	174,000	701,000
Visual Resources								
Moderate [B]	270,000	95,000	25,000	299,000	325,000	293,000	626,000	235,000
High [C]	684,000	792,000	1,080,000	805,000	665,000	696,000	189,000	803,000
Livestock Grazing								
High [D]	1,141,000	1,123,000	1,137,000	1,136,000	1,054,000	1,085,000	921,000	1,134,000
Transportation and Travel Management								
Moderate [E]	474,000	1,070,000	1,122,000	1,121,000	1,086,000		1,018,000	1,121,000
High [F]	236,000	300	0	300	300		300	400
Land Use Authorizations								
Utility Right-of-Way (ROW) Corridors								
High [G]	8,000	32,000	32,000	32,000	32,000		32,000	14,000
Wind Energy Development								
High [H]	77,000	16,000	98,000	27,000	15,000		10,000	8,000
Areas of Critical Environmental Concern (ACECs)								
High [I]	179,000	179,000	205,000	204,000	6,000	76,000	0	186,000

[A] High = conditional suppression areas.
[B] Moderate = Visual Resource Management (VRM) Class III.
[C] High = VRM Class IV.
[D] High = available to livestock grazing.
[E] Moderate = travel limited to designated routes.
[F] High = open to cross-country motorized vehicle use.
[G] High = designated utility ROW corridors.
[H] High = expected wind energy development areas.
[I] High = areas with relevant and important cultural resource values where ACEC management is not proposed.

Impacts from the No Action Alternative

The No Action Alternative would result in more impacts to the integrity and setting of cultural resources than any of the action alternatives except Alternative II. The No Action Alternative would make more of the High and Moderate Cultural Resource Density Zones susceptible to impacts from wildland fire, livestock grazing, and transportation and travel management than any of the other alternatives. Surface disturbance and visual intrusions related to wind energy development would be more under the No Action Alternative than under Alternatives I, III, IV, V, and VI, but less than under Alternative II. The No Action Alternative would make slightly more acres susceptible to visual intrusions than Alternatives V and I, but fewer than Alternatives II, III, IV-A, IV-B, and VI. ACEC designations under the No Action Alternative would result in less susceptibility to impacts on more land in the High and Moderate Cultural Resource Density Zones than Alternatives II, III, and VI, about the same as Alternative I, and substantially less than Alternatives IV and V.

Overall, moderate adverse impacts to the integrity and setting of cultural resources may be expected due to the relative lack of restrictions on and increased use of cross-country motorized vehicles.

Impacts from Alternative I

Alternative I would result in more impacts to the integrity and setting of cultural resources than Alternatives IV and V, about the same as Alternative VI, but less than the No Action Alternative and Alternatives II and III. More of the High and Moderate Cultural Resource Density Zones would be vulnerable to impacts from wildland fire, livestock grazing, and wind energy development under this alternative than under Alternatives IV and V. Alternative I would make less of the High and Moderate Density Zones vulnerable to impacts from these same activities in comparison to the No Action Alternative and Alternatives II and III. In addition, Alternative I would reduce motorized access to more of

the High and Moderate Cultural Resource Density Zones through closure than the No Action Alternative and Alternatives II, III, IV, and VI but not as much as Alternative V. Under Alternative I, the visual setting of cultural resources would be less susceptible to visual intrusions than under the No Action Alternative and Alternative IV, substantially less susceptible in relation to Alternatives II, III, and VI, but substantially more susceptible in relation to Alternative V. ACEC designations under Alternative I would make less land in the High and Moderate Cultural Resource Density Zones susceptible to impacts than Alternatives II, III, and VI, about the same as the No Action Alternative, and substantially more than Alternatives IV and V.

Overall, Alternative I would result in minor adverse impacts to the integrity and setting of cultural resources.

Impacts from Alternative II

Alternative II would result in the highest level of impacts to the integrity and setting of cultural resources of all the alternatives. More of the High and Moderate Cultural Resource Density Zones would be vulnerable to impacts from visual intrusions, utility ROW development, and wind energy development than any of the alternatives and only the No Action Alternative would make more area vulnerable to impacts from wildland fire, transportation and travel, and livestock grazing. Although the No Action Alternative would make slightly more acres available for livestock grazing, Alternative II would allow the highest levels of forage utilization of all the alternatives. No ACECs would be designated under Alternative II; no special management provisions designed to reduce impacts to cultural resources would be implemented.

Overall, moderate adverse impacts to the integrity and setting of cultural resources may be expected due to increased opportunities for commercial uses and the increase in development and access as a result of those uses.

Impacts from Alternative III

Alternative III would result in more impacts to the integrity and setting of cultural resources than Alternatives I, IV, V, and VI, but less than the No Action Alternative and Alternative II. More of the High and Moderate Cultural Resource Density Zones would be vulnerable to impacts from wildland fire, wind energy development, and livestock grazing under this alternative than under Alternatives I, IV, V, and VI and more area would be vulnerable to impacts from transportation and travel management than under Alternatives I, IV, and V. Only Alternative II would make more of the High and Moderate Density Zones vulnerable to impacts from visual intrusions. ACEC designations under Alternative III would provide special protective management on slightly more land in the High and Moderate Cultural Resource Density Zones than Alternative II, but substantially less than the No Action Alternative and Alternatives I, IV, V, and VI.

Overall, Alternative III would result in minor adverse impacts to the integrity and setting of cultural resources.

Impacts from Alternative IV

Alternative IV would result in a lower level of impacts to the integrity and setting of cultural resources than all of the alternatives except Alternative V. More of the High and Moderate Cultural Resource Density Zones would be susceptible to impacts from wildland fire, livestock grazing, transportation and travel, and ACEC management under Alternative IV than under Alternative V but less than under the No Action Alternative and Alternatives I, II, III, and VI. Alternative IV would make substantially less area susceptible to visual intrusions than Alternatives II, III, and VI, more than the No Action Alternative, but substantially more than Alternatives I and V. Impacts from utility ROW development in the High and Moderate Cultural Resource Density Zones under Alternative IV would be more than under the No Action Alternative and Alternative VI, and the same as Alternatives I, II, III, and V. Under Alternative IV, wind energy development would affect more land than under Alternatives V and VI, substantially less land than the No Action Alternative and Alternatives II and III, and about the same as Alternative I.

ACEC designations under Alternative IV-A would provide special protective management on substantially more land in the High and Moderate Cultural Resource Density Zones than the No Action Alternative and Alternatives I, II, III, IV-B, and VI, but less than Alternative V. Alternative IV-B would provide special

management on more lands than the No Action Alternative and Alternatives I, II, III, and VI, but substantially less than Alternatives IV-A and V.

Overall, Alternative IV would result in minor adverse impacts to the integrity and setting of cultural resources.

Impacts from Alternative V

Alternative V would result in the lowest level of impacts to the integrity and setting of cultural resources of any of the alternatives. Fewer acres in the High and Moderate Cultural Resource Density Zones would be vulnerable to impacts from visual intrusions, livestock grazing, and transportation and travel under this alternative than under the No Action Alternative and Alternatives I, II, III, IV, and VI. Although the area open to cross-country motorized travel is slightly more than Alternative II and the same as the other action alternatives, the area closed to motorized vehicle use is much larger under Alternative V. Impacts from utility ROW development would be the same as Alternative I, II, III, and IV, but more than the No Action Alternative and Alternative VI. Impacts from wind energy development would be less than the No Action Alternative and Alternatives I, II, III, and IV and about the same as Alternative VI. ACEC designations under Alternative V would provide special protective management on substantially more land in the High and Moderate Cultural Resource Density Zones than any of the other alternatives.

Overall, Alternative V would result in minor adverse impacts to the integrity and setting of cultural resources.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would result in more impacts to the integrity and setting of cultural resources than Alternatives IV and V, about the same as Alternative I, but less than the No Action Alternative and Alternatives II and III. More of the High and Moderate Cultural Resource Density Zones would be vulnerable to impacts from wildland fire, livestock grazing, and transportation and travel under this alternative than under Alternatives IV and V. Alternative VI would make less of the High and Moderate Density Zones vulnerable to impacts from these same activities in comparison to the No Action Alternative and Alternatives II and III. In addition, Alternative VI would make more acres available for motorized access in the High and Moderate Cultural Resource Density Zones than Alternatives I, IV, and V but about the same as the No Action Alternative and Alternatives II and III. Under Alternative VI, the visual setting of cultural resources would be less susceptible to visual intrusions than under Alternatives II and III, but more susceptible in relation to the No Action Alternative and Alternatives I, IV, and V. ACEC designations under Alternative VI would make substantially less land in the High and Moderate Cultural Resource Density Zones susceptible to impacts than Alternatives II and III, slightly more than the No Action Alternative and Alternative I, and substantially more than Alternatives IV and V.

Overall, Alternative VI would result in minor adverse impacts to the integrity and setting of cultural resources.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Cumulative impacts to cultural resources consist of the incremental effects of the alternatives when added to other past, present, and reasonably foreseeable future actions. These effects can occur over a long period of time, resulting in the gradual but permanent loss of archaeological information and the degradation of places of traditional cultural importance to the tribes.

Because of strong similarities among types of archaeological, historical, and traditional cultural resources, the planning area and adjacent portions of the BLM Burley, Bruneau, Shoshone, and Wells (NV) Field Offices and Snake River Birds of Prey National Conservation Area, as well as the South Hills Unit of the Sawtooth National Forest and the Jarbidge Ranger District of the Humboldt-Toiyabe National Forest, form the geographic boundary for the analysis of cumulative impacts to cultural resources. The area includes Federal, State, and private lands within the boundary. The temporal scope of the analysis is approximately 20 years or the life of the plan. The following represent the past, present, and reasonably

foreseeable future actions whose effects provide the context for the cumulative impacts analysis for cultural resources.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect cultural resources:

- Wildland Fire Ecology and Management,
- Livestock Grazing,
- Recreation, and
- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter.

With regard to recreation actions, and in addition to the discussion in the *Introduction*, an increase in recreation would likely lead to heavier use of existing sites as well as the spread of dispersed use into less heavily used areas. Cumulative effects to cultural resources would vary with the degree of management exerted on recreational activities throughout the analysis area.

With regard to land use authorizations, and in addition to the discussion in the *Introduction*, these developments have or will result in improved access to remote or inaccessible areas and are expected to result in unavoidable impacts to the physical integrity and setting of cultural resources. Mitigation measures and project design features should alleviate direct effects to archaeological sites, but adverse impacts to traditional cultural properties and nationally recognized historic trails, including their settings, are more difficult to resolve.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Under the No Action Alternative, fire size and intensity and associated impacts to cultural resources in the analysis area are expected to continue to increase. Recreation and off-highway vehicle use would continue to be lightly managed, thereby increasing the risks of vandalism and inadvertent impacts to archaeological sites. Because extensive areas would remain open to cross-country motorized vehicle use, riders from surrounding areas with more restrictions (e.g., National Forests and the Birds of Prey National Conservation Area) may converge on the planning area, increasing existing impacts and spreading new impacts to previously unused areas, while decreasing impacts to surrounding areas with more restrictions. The cumulative effects of livestock grazing on cultural resources in the analysis area would continue to build at a moderate rate in comparison to the other alternatives. Effects from land use authorizations would be higher than Alternatives I, III, IV, V, and VI due to fewer restrictions on commercial development and a lack of pro-active protective measures.

Cumulative Impacts from Alternative I

Impacts on cultural resources related to wildland fire are expected to decrease in the analysis area compared to the current trend because of more aggressive use of fuels treatments and vegetation restoration projects to reduce fire size and intensity. Likewise, increased management of dispersed and concentrated recreational activity should reduce related vandalism and inadvertent impacts to cultural resources. Impacts to cultural resources from motorized recreation would be greatly reduced in the long term under this alternative. Restrictions in the planning area, however, may result in increased impacts on adjacent Federal and State lands where motorized recreational use is less restricted. Any increased impacts to adjacent BLM lands may be short-term since the Bruneau, Burley, and Shoshone Field Offices will prepare resource management plans for their respective planning areas in the near future, and it is assumed, following current policy, their transportation and travel allocations would substantially decrease the amount of areas open to cross-country motorized vehicle use in the region. Impacts from livestock grazing are expected to continue on Federal, State, and private lands in the analysis area, but riparian, wildlife, cultural resource, and grazing management actions under Alternative I should reduce future grazing-related impacts to cultural resources compared to the No Action Alternative. Finally, impacts to the integrity and setting of important cultural resources are expected to increase throughout the region

due to the development of new energy projects. These impacts should be less extensive than under the No Action Alternative and Alternative II, which incorporate fewer restrictions on commercial development.

Cumulative Impacts from Alternative II

Cumulative impacts from livestock grazing and commercial development would be highest under this alternative. Although no areas would be open to cross-country motorized vehicle use, the benefits to cultural resources may be offset by the expected increase in route density associated with commercial operations. As with Alternative I, the lack of cross-country motorized recreation opportunities would likely push current users onto adjacent lands with fewer restrictions. This alternative also places less land in critical suppression areas than any other alternative and would convert more vegetation to non-native perennial forage, relying on heavier grazing use, among other means, to reduce fuels. In terms of effects on cultural resources, the latter strategy would use one impact agent (livestock) to control another (fire). Any benefits from fuels reduction may be off-set by grazing impacts.

Cumulative Impacts from Alternative III

Direct impacts to cultural resources from wildland fire may be reduced in this alternative, but the effects of suppression, road development or improvement, and surface-disturbing fuels treatments are likely to increase in comparison to the other alternatives. Livestock grazing impacts would be second only to Alternative II. Cumulative impacts related to recreation, cross-country motorized vehicle use, and energy projects would be similar to Alternative I.

Cumulative Impacts from Alternative IV

Cumulative impacts to cultural resources from wildland fire, utility development areas, and wind energy development would be similar to Alternative I. Recreation use would be managed more closely than under the No Action Alternative, but less intensely than Alternatives I, II, and III. Cumulative impacts from livestock grazing would be reduced compared to the No Action Alternative and Alternatives I, II, and III.

Cumulative Impacts from Alternative V

Alternative V would result in the fewest direct, indirect, and cumulative impacts to cultural resources from commercial use and development because it incorporates more restrictions than the other alternatives. Impacts from wildland fire should decrease compared to the current trend but it would take more time to achieve objectives due to a less aggressive fuels and restoration program. Recreation use would be managed more closely than under the No Action Alternative, but less intensely than Alternatives I, II, and III.

Cumulative Impacts from Alternative VI (Proposed RMP)

Cumulative impacts to cultural resources from wildland fire would be similar to Alternative I. Less land would be available for utility development areas and wind energy development than any of the action alternatives, therefore incremental effects from future development would be reduced. Recreation use would be managed more closely than under the No Action Alternative and Alternatives II, IV, and V, but similarly to Alternatives I and III. Cumulative impacts from livestock grazing would be reduced compared to the No Action Alternative and Alternatives II and III.

In general, all of the action alternatives are expected to decrease the rate of incremental effects to cultural resources compared to the No Action Alternative.

4.3.13. Visual Resources

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to visual resources:

- **Visual Resource Inventory Class** – Visual Resource Inventory (VRI) Classes are the categories the BLM uses to classify visual character and are a way to communicate the degree of visual quality in an

area. VRI Class I indicates high visual quality, while VRI Class IV indicates low visual quality (BLM Manual H-8410-1). The Visual Resource Inventory conducted in late 2007 and early 2008 classified the visual resources in the planning area. The inventory was updated in 2012 to include designations as required by Omnibus Public Land Management Act of 2009, which assigns Class I to Wilderness Areas and scenic sections of designated Wild and Scenic Rivers. Changes in the VRI Class would be a result of impacts to visual quality.

- **Visual Resource Management Class** – Visual Resource Management (VRM) Classes allow or disallow actions that have the potential to impact scenic value. Because VRM Classes I and II would retain the existing visual landscape of the area, scenic values in areas allocated to VRM Class I or II would be maintained.

Methods and Assumptions

Impacts to visual resources from management in the following sections of Chapter 2 were analyzed in detail: *Visual Resources*, *Lands with Wilderness Characteristics*, *Land Use Authorizations*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives, impact the indicators for visual resources, or because the management involves potential site-specific impacts from project proposals that are not known at this time. Impacts from management for visual resources can be found under *Impacts from Visual Resources Actions* in the *Tribal Rights and Interests*, *Cultural Resources*, *Lands with Wilderness Characteristics*, *Land Use Authorizations*, *Leasable Minerals*, *Salable Minerals*, *Locatable Minerals*, *National Historic Trails, Wilderness*, and *Wild and Scenic Rivers* sections.

The impacts from management in each section are described independent of the other sections. Under *Summary of Direct and Indirect Impacts*, the impacts are summarized and the interaction between the relationships is explained.

Visual resources are managed by assigning Visual Resource Management (VRM) classes to geographic areas. The objective for each VRM Class describes how that class should be managed (BLM Handbook H-8410-1):

- VRM Class I areas are managed to preserve the existing character of the landscape. The level of change to the landscape should be very low and must not attract attention.
- VRM Class II areas are managed to retain the existing character of the landscape. The level of change to the landscape should be low and repeat the basic elements of form, line, color, and texture found in the natural features of the landscape.
- VRM Class III areas are managed to partially retain the existing character of the landscape. The level of change to the landscape can be moderate and should repeat the basic elements found in the natural landscape. Management activities may attract attention, but should not dominate the view of the casual observer.
- VRM Class IV areas are managed to provide for activities that require major modification of the landscape. The level of change to the landscape can be high, and management activities may dominate the view and be the major focus of attention. Impacts can still be minimized through location and design by repeating the basic elements found in the natural landscape.

Using this framework, areas managed for VRM Class I retain their Visual Resource Inventory (VRI) Class, no matter what VRI Class that may be. For example, an area inventoried as VRI Class III and managed as VRM Class I remains VRI Class III because the management preserves the existing character. If that same area was managed as VRM Class II, III, or IV, the potential to change the landscape exists, potentially altering the character of the landscape enough that future inventories would result in a reclassification. A management class that improves the visual quality of an area does not exist, although this would happen through management actions that improve vegetation or remove structures.

In order to assess the impacts of VRM on visual resources, VRM Classes were compared to VRI Classes using a geographic information system to identify potential impacts to VRI Classes. For example, if an area was inventoried at VRI Class I, but the management is for VRM Class IV, the potential for a decrease in the visual quality, and thus VRI Class, exists.

Lands with Wilderness Characteristics were compared to the VRI Classes for those areas. It was assumed that managing these lands for their wilderness characteristics would maintain or improve the VRI Class, while not managing these lands for those characteristics has the potential to decrease the VRI Class.

Land use authorizations can involve structures including buildings, roads, and transmission lines. Structures can detract from the visual quality of an area, especially if they do not repeat the basic elements of the landscape. Two allocations under the umbrella of land use authorizations are likely to have landscape-level impacts to visual resources: utility right-of-way (ROW) corridors and wind energy developments. Areas identified as utility ROW corridors were compared to the VRI Class for those areas using a geographic information system. Based on current demand for utility ROW corridors, it was assumed that development would occur in all identified corridors over the life of the plan. Such development is assumed to decrease the VRI Class by adding structures to the landscape.

Land use authorization allocations allowing wind energy development would also impact visual resources. Wind towers do not often repeat the basic elements of the landscape. Wind energy development also involves ancillary features such as roads, structures, and transmission lines that also impact visual resources. Expected wind energy development areas were compared spatially to VRI Classes for those areas. Such development in these areas is assumed to decrease the VRI Class.

The Salmon Falls Creek and Bruneau-Jarbidge areas were determined to have relevant and important scenic values during the evaluation of nominated Areas of Critical Environmental Concern (ACECs). ACEC management with regard to scenic relevant and important values is handled through the designation of VRM Classes and restrictions on wind and utility development. Lands would have to be in VRM Class I or II to maintain relevant and important scenic values.

The boundary of the Salmon Falls Creek ACEC is the same in all alternatives in which it appears and encompasses all lands with relevant and important scenic values. The boundary of the Bruneau-Jarbidge ACEC has several variations, so the number of acres with ACEC management is compared to the number of acres with relevant and important scenic values.

Direct and Indirect Impacts

Impacts from Visual Resource Actions

Visual Resource Management (VRM) Classes outline the level of change that could occur within that class. Identifying an area as a specific management class does not guarantee that change will take place. The discussion below identifies the number of acres that would retain or lose visual quality due to management in a specific VRM Class; however, the potential for every acre to lose visual quality due to management in a specific VRM Class is low.

The 2008 and the updated 2012 Visual Resource Inventory (VRI) for the planning area identified 70,000 acres as VRI Class I, 91,000 acres as VRI Class II, 51,000 acres as VRI Class III, and 1,159,000 acres as VRI Class IV.

The following indicator was used to analyze the impacts from Visual Resource actions to visual resources:

- Visual Resource Inventory (VRI).

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 89% of VRI Class I lands would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 11% would be in VRM Class II, allowing a low level of change.

With regard to VRI Class II lands, 41% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 29% would be in VRM Class II, allowing a low level of change; 13% would be in VRM Class III, potentially resulting in only partially retaining the character of

those lands; and 17% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 4% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 35% would be in VRM Class II, allowing a low level of change; 61% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and less than 1% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class IV lands, 2% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 5% would be in VRM Class II, allowing a low level of change; 21% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 72% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-273 displays the number of acres of each VRI Class in each VRM Class for the No Action Alternative. Compared to the other alternatives, the No Action Alternative would have the greatest reduction of VRI Class I areas due to the No Action Alternative VRM Classes.

Table 4-273. Visual Resource Management Classes by Visual Resource Inventory Class in the No Action Alternative (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	62,000	37,000	2,000	28,000
VRM Class II	8,000	26,000	18,000	59,000
VRM Class III	0	12,000	31,000	242,000
VRM Class IV	0	16,000	< 500	830,000

Impacts from Management Specific to Alternative I

Under Alternative I, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI Class I acres would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class II lands, 23% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 61% would be in VRM Class II, allowing a low level of change; 3% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; 13% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 2% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 92% would be in VRM Class II, allowing a low level of change; and 6% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class IV lands, 1% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 8% would be in VRM Class II, allowing a low level of change; 12% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 79% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-274 displays the number of acres in each VRI Class by VRM Class for Alternative I. Alternative I would have less impact to VRI Class I lands than the No Action Alternative, but a similar impact as in the other action alternatives. Alternative I would have a large positive impact with regards to the limited amount of change allowed to VRI Class II lands.

Table 4-274. Visual Resource Management Classes by Visual Resource Inventory Class in Alternative I (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	21,000	1,000	15,000
VRM Class II	0	55,000	47,000	89,000
VRM Class III	200	3,000	3,000	135,000
VRM Class IV	0	12,000	0	920,000

VRM Class management varies for each alternative based on the alternative's focus. The focus of Alternative I is enhancing and sustaining historic uses. This would change VRM Management from current management in the No Action Alternative to more restrictive in 18% of the planning area, less restrictive in 20% of the planning area, and no change in VRM management in 62% of the planning area. Table 4-275 displays the shifts in management of Alternative I as compared to the No Action Alternative.

Table 4-275. Changes in Visual Resource Management from the No Action Alternative to Alternative I (Acres)

Shift in Management	Acres
Less Restrictive	244,000
No Change	858,000
More Restrictive	269,000

Impacts from Management Specific to Alternative II

Under Alternative II, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI Class I acres would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class II lands, no acres would be managed as VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 2% would be in VRM Class II, allowing a low level of change; 10% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 88% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 2% would be in VRM Class II, allowing a low level of change; and less than 98% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class IV lands, 1% would be in VRM Class II, allowing a low level of change; 1% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 98% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-276 displays the number of acres in each VRI Class by VRM Class for Alternative II. Alternative II would have less impact to VRI Class I lands than the No Action Alternative, but a similar impact as in other action alternatives. Very few VRI Class II acres would experience no change to visual character; most VRI Class II lands would have the potential for moderate change to visual character under this alternative.

Table 4-276. Visual Resource Management Classes by Visual Resource Inventory Class in Alternative II (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	0	0	0
VRM Class II	0	2,000	1,000	6,000
VRM Class III	200	9,000	0	16,000
VRM Class IV	0	80,000	50,000	1,137,000

VRM Class management varies for each alternative based on the alternative's focus. The focus of Alternative II is increasing commercial uses. This would change VRM Management from current management in the No Action Alternative to more restrictive in 1% of the planning area, less restrictive in 33% of the planning area, and no change in VRM management in 66% of the planning area. Alternative II has the greatest change to less restrictive of all the alternatives. Table 4-277 displays the shifts in management of Alternative II as compared to the No Action Alternative.

Table 4-277. Changes in Visual Resource Management from the No Action Alternative to Alternative II (Acres)

Shift in Management	Acres
Less Restrictive	446,000
No Change	908,000
More Restrictive	17,000

Impacts from Management Specific to Alternative III

Under Alternative III, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI Class I acres would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class II lands, 1% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 2% would be in VRM Class II, allowing a low level of change; 74% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 23% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 2% would be in VRM Class II, allowing a low level of change; and 98% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class IV lands, less than 1% would be in VRM Class II, allowing a low level of change; 20% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 80% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-278 displays the number of acres in each VRI Class by VRM Class for Alternative III. Alternative III would have less impact to VRI Class I lands than the No Action Alternative, but a similar impact as the other action alternatives. Very few VRI Class II lands would experience no change to visual character.

Table 4-278. Visual Resource Management Classes by Visual Resource Inventory Class in Alternative III (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	1,000	0	0
VRM Class II	0	2,000	1,000	6,000
VRM Class III	200	67,000	50,000	228,000
VRM Class IV	0	21,000	0	925,000

VRM Class management varies for each alternative based on the alternative's focus. The focus of Alternative III is restoring ecosystem resilience through intensive fuels management and enhanced fire suppression capabilities. This would change VRM Management from current management in the No Action Alternative to more restrictive in 10% of the planning area, less restrictive in 25% of the planning area, and no change in VRM management in 65% of the planning area. Table 4-279 displays the shifts in management of Alternative III as compared to the No Action Alternative.

Table 4-279. Changes in Visual Resource Management from the No Action Alternative to Alternative III (Acres)

Shift in Management	Acres
Less Restrictive	348,000
No Change	891,000
More Restrictive	132,000

Impacts from Management Specific to Alternative IV

Under Alternative IV, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI Class I acres would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class II lands, 49% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 39% would be in VRM Class II, allowing a low level of change; 11% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and less than 1% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 4% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 27% would be in VRM Class II, allowing a low level of change; and 69% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class IV lands, 1% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 2% would be in VRM Class II, allowing a low level of change; 28% (in Alternative IV-A) and 25% (in Alternative IV-B) would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 69% (in Alternative IV-A) and 72% (in Alternative IV-B) would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-280 displays the number of acres in each VRI Class by VRM Class for Alternative IV. Alternative IV would have less impact to VRI Class I lands than the No Action Alternative, but a similar impact as in the other action alternatives. Alternative IV would protect more VRI Class II lands from change than any other alternative expect Alternative V.

Table 4-280. Visual Resource Management Classes by Visual Resource Inventory Class in Alternative IV (Acres)

VRM Class		VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I		70,000	45,000	2,000	10,000
VRM Class II		0	35,000	14,000	20,000
VRM Class III	Alternative IV-A	200	10,000	35,000	329,000
	Alternative IV-B				297,000
VRM Class IV	Alternative IV-A	0	1000	0	800,000
	Alternative IV-B				832,000

VRM Class management varies for each alternative based on the alternative's focus. The focus of Alternative IV is actively restoring ecosystem resilience through restoration and managing uses. This would change VRM Management from current management in the No Action Alternative to more restrictive in 18% of the planning area in Alternative IV-A and 16% in Alternative IV-B, less restrictive in 17% of the planning area in Alternative IV-A and 18% in Alternative IV-B, and no change in VRM management in 65% of the planning area in Alternative IV-A and 66% in Alternative IV-B. Table 4-281 displays the shifts in management of Alternative IV as compared to the No Action Alternative.

Table 4-281. Changes in Visual Resource Management from the No Action Alternative to Alternative IV (Acres)

Shift in Management	Alt IV-A Acres	Alt IV-B Acres
Less Restrictive	234,000	240,000
No Change	894,000	912,000
More Restrictive	243,000	218,000

Impacts from Management Specific to Alternative V

Under Alternative V, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI Class I acres would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class II lands, 92% would be in VRM Class II, allowing a low level of change, and 5% would be managed as VRM Class III, potentially resulting in only partially retaining the character of those lands; and 3% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 94% would be in VRM Class II, allowing a low level of change; and 6% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class IV lands, 15% would be in VRM Class II, allowing a low level of change; 55% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 30% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-282 displays the number of acres in each VRI Class by VRM Class for Alternative V. Alternative V would have less impact to VRI Class I lands than the No Action Alternative, but a similar impact as in the other action alternatives. Alternative V would protect more VRI Class II lands from change than any other alternative.

Table 4-282. Visual Resource Management Classes by Visual Resource Inventory Class in Alternative V (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	0	0	0
VRM Class II	0	83,000	48,000	170,000
VRM Class III	200	5,000	3,000	640,000
VRM Class IV	0	3,000	0	349,000

VRM Class management varies for each alternative based on the alternative's focus. The focus of Alternative V is restoring habitats toward historic vegetation communities using natural recovery. This would change VRM Management from current management in the No Action Alternative to more restrictive in 48% of the planning area, less restrictive in 9% of the planning area, and no change in VRM management in 43% of the planning area. Alternative V has the greatest change to more restrictive of all the alternatives. Table 4-283 displays the shifts in management of Alternative V as compared to the No Action Alternative.

Table 4-283. Changes in Visual Resource Management from the No Action Alternative to Alternative V (Acres)

Shift in Management	Acres
Less Restrictive	128,000
No Change	593,000
More Restrictive	650,000

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, nearly all VRI Class I acres would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Less than 1% of VRI Class I acres would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class II lands, 8% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 48% would be in VRM Class II, allowing a low level of change; 23% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 21% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

With regard to VRI Class III lands, 6% would be in VRM Class II, allowing a low level of change; and 94% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands.

With regard to VRI Class IV lands, 1% would be in VRM Class I, resulting in preservation of the existing visual character of those lands. Additionally, 3% would be in VRM Class II, allowing a low level of change; 15% would be in VRM Class III, potentially resulting in only partially retaining the character of those lands; and 81% would be in VRM Class IV, potentially resulting in a high level of change to those acres.

Table 4-284 displays the number of acres in each VRI Class by VRM Class for Alternative VI. Alternative VI would have less impact to VRI Class I lands than the No Action Alternative, but a similar impact as in the other action alternatives. Alternative VI would have a beneficial impact with regards to the limited amount of change allowed to VRI Class II lands.

Table 4-284. Visual Resource Management Classes by Visual Resource Inventory Class in Alternative VI (Proposed RMP) (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	7,000	0	9,000
VRM Class II	0	44,000	3,000	33,000
VRM Class III	200	21,000	48,000	179,000
VRM Class IV	0	19,000	0	938,000

VRM Class management varies for each alternative based on the alternative's focus. The focus of Alternative VI is actively restoring the resiliency of sagebrush steppe ecosystem through restoration and enhanced fire management, while balancing resource protection and uses. This would change VRM Management from current management in the No Action Alternative to more restrictive in 9% of the planning area, less restrictive in 23% of the planning area, and no change in VRM management in 68% of the planning area. Table 4-285 displays the shifts in management of Alternative VI as compared to the No Action Alternative.

Table 4-285. Changes in Visual Resource Management from the No Action Alternative to Alternative VI (Acres)

Shift in Management	Acres
Less Restrictive	310,000
No Change	930,000
More Restrictive	131,000

Impacts from Lands with Wilderness Characteristics Actions

Visual character is related to the criteria used to determine the presence of wilderness characteristics. Wilderness characteristics include opportunities for solitude, opportunities for primitive, unconfined recreation, and naturalness. Criteria used to determine whether wilderness characteristics are present include the absence of roads; structures (e.g. developed recreation facilities, fences, pipelines), and power lines; and modifications such as vegetative treatment areas and mines (BLM, 2009e). These

features can create visual contrast levels that cause them to be “substantially noticeable.” The presence of such structures changes the visual quality of the area.

Consideration of the presence of native vegetation communities is also an indicator of visual quality. Vegetation plays an important role in the Visual Resource Inventory (VRI) process and the presence of native vegetation communities enhances the visual character of the area.

Management decisions to preserve the wilderness character of Lands with Wilderness Characteristics also help to preserve the visual character of the area, while a decision not to manage those lands for their wilderness characteristics may result in a reduction of visual quality.

The 2012 Wilderness Characteristics Inventory identified 104,000 acres of Lands with Wilderness Characteristics. Of those, 3,000 are in VRI Class I, 54,000 are in VRI Class II, 14,000 are in VRI Class III, and 32,000 are in VRI Class IV.

The following indicators were used to analyze the impacts of Lands with Wilderness Characteristics actions on visual resources:

- Visual Resource Inventory (VRI) and
- Visual Resource Management (VRM) Class.

Impacts from Management Specific to the No Action Alternative and Alternatives II, III, and VI (Proposed RMP)

None of the Lands with Wilderness Characteristics would be managed for wilderness characteristics under the No Action Alternative and Alternatives II, III, and VI. Thus, none of those acres would receive management for wilderness characteristics that would benefit their visual resources. For Alternatives II, III, and VI, all VRI Class I Lands with Wilderness Characteristics would be managed as VRM Class I even though the Lands with Wilderness Characteristics would not be managed for wilderness characteristics or not.

Impacts from Management Specific to Alternative I

Under Alternative I, 50% of the Lands with Wilderness Characteristics (52,000 acres) would be managed for wilderness characteristics while 50% of the Lands with Wilderness Characteristics (52,000 acres) would not be managed for wilderness characteristics.

With regard to VRI Class I Lands with Wilderness Characteristics, 67% would be managed for their wilderness characteristics, management that would benefit their visual quality; 33% would not be managed for their wilderness characteristics. All VRI Class I Lands with Wilderness Characteristics would be managed as VRM Class I regardless of whether managed for wilderness characteristics or not.

In VRI Class II Lands with Wilderness Characteristics, 55% would be managed for their wilderness characteristics, management that would benefit their visual quality; 45% would not be managed for their wilderness characteristics.

In VRI Class III Lands with Wilderness Characteristics, 14% would be managed for their wilderness characteristics, management that would benefit their visual quality; 86% would not be managed for their wilderness characteristics.

In VRI Class IV Lands with Wilderness Characteristics, 56% would be managed for their wilderness characteristics, management that would benefit their visual quality; 44% would not be managed for their wilderness characteristics.

Table 4-286 displays management for Lands with Wilderness Characteristics for each VRI Class in Alternative I. It further displays how each VRI Class would be managed in VRM Classes. Fewer VRI Class I and II lands would be preserved through the management of Lands with Wilderness Characteristics for those wilderness characteristics in Alternative I than in Alternative V, but would protect more than the No Action Alternative and Alternatives II, III, IV, and VI.

Table 4-286. Management for Lands with Wilderness Characteristics by Visual Resource Inventory Class and Visual Resource Management Class in Alternative I (Acres)

Management	Lands with Wilderness Characteristics Managed for Wilderness Characteristics	Lands with Wilderness Characteristics Not Managed for Wilderness Characteristics
VRI Class I managed as:		
VRM Class I	2,000	1,000
VRM Class II	0	0
VRM Class III	0	0
VRM Class IV	0	0
VRI Class II managed as:		
VRM Class I	9,000	6,000
VRM Class II	20,000	12,000
VRM Class III	1,000	0
VRM Class IV	0	7,000
VRI Class III managed as:		
VRM Class I	1,000	0
VRM Class II	1,000	12,000
VRM Class III	< 100	0
VRM Class IV	0	0
VRI Class IV managed as:		
VRM Class I	8,000	<100
VRM Class II	10,000	7,000
VRM Class III	<100	0
VRM Class IV	0	7,000

Impacts from Management Specific to Alternative IV

Under Alternative IV, 36% of the Lands with Wilderness Characteristics (37,000 acres) would be managed for wilderness characteristics while 64% of the Lands with Wilderness Characteristics (67,000 acres) would not be managed for wilderness characteristics.

With regard to VRI Class I Lands with Wilderness Characteristics, 33% would be managed for their wilderness characteristics, management that would benefit their visual quality; 67% would not be managed for their wilderness characteristics. All VRI Class I Lands with Wilderness Characteristics would be managed as VRM Class I regardless of whether managed for wilderness characteristics or not.

In VRI Class II Lands with Wilderness Characteristics, 19% would be managed for their wilderness characteristics, management that would benefit their visual quality; 81% would not be managed for their wilderness characteristics.

In VRI Class III Lands with Wilderness Characteristics, 86% would be managed for their wilderness characteristics, management that would benefit their visual quality; 14% would not be managed for their wilderness characteristics.

In VRI Class IV Lands with Wilderness Characteristics, 38% would be managed for their wilderness characteristics, management that would benefit their visual quality; 62% would not be managed for their wilderness characteristics.

Table 4-287 displays management for wilderness characteristics for each VRI Class in Alternative IV. It further displays how each VRI Class would be managed in VRM Classes. Fewer VRI Class I and II lands would be preserved through the management of Lands with Wilderness Characteristics for those wilderness characteristics in Alternatives I and V, but would protect more than the No Action Alternative and Alternatives II, III, and VI.

Table 4-287. Management for Lands with Wilderness Characteristics by Visual Resource Inventory Class and Visual Resource Management Class in Alternative IV (Acres)

Management	Lands with Wilderness Characteristics Managed for Wilderness Characteristics	Lands with Wilderness Characteristics Not Managed for Wilderness Characteristics
VRI Class I managed as:		
VRM Class I	1,000	2,000
VRM Class II	0	0
VRM Class III	0	0
VRM Class IV	0	0
VRI Class II managed as:		
VRM Class I	0	35,000
VRM Class II	12,000	0
VRM Class III	0	8,000
VRM Class IV	0	0
VRI Class III managed as:		
VRM Class I	0	2,000
VRM Class II	12,000	0
VRM Class III	0	< 100
VRM Class IV	0	0
VRI Class IV managed as:		
VRM Class I	0	8,000
VRM Class II	12,000	0
VRM Class III	0	10,000
VRM Class IV	0	2,000

Impacts from Management Specific to Alternative V

All of the Lands with Wilderness Characteristics (3,000 acres VRI Class I, 55,000 acres VRI Class II, 14,000 VRI Class III, and 32,000 acres VRI Class IV) would be managed for those characteristics under Alternative V. Thus, all of those acres would receive management that would benefit their visual resources. All VRI Class I Lands with Wilderness Characteristics would be managed as VRM Class I.

Table 4-288 displays management for wilderness characteristics for each VRI Class in Alternative V. It further displays how each VRI Class would be managed in VRM Classes. Alternative V would protect the most Lands with Wilderness Characteristics, thereby benefiting visual resources, than all the other alternatives.

Table 4-288. Management for Lands with Wilderness Characteristics by Visual Resource Inventory Class and Visual Resource Management Class in Alternative IV (Acres)

Management	Lands with Wilderness Characteristics Managed for Wilderness Characteristics	Lands with Wilderness Characteristics Not Managed for Wilderness Characteristics
VRI Class I managed as:		
VRM Class I	3,000	0
VRM Class II	0	0
VRM Class III	0	0
VRM Class IV	0	0
VRI Class II managed as:		
VRM Class I	0	0
VRM Class II	54,000	0
VRM Class III	1,000	0
VRM Class IV	0	0

Management	Lands with Wilderness Characteristics Managed for Wilderness Characteristics	Lands with Wilderness Characteristics Not Managed for Wilderness Characteristics
VRI Class III managed as:		
VRM Class I	0	0
VRM Class II	14,000	0
VRM Class III	< 100	0
VRM Class IV	0	0
VRI Class IV managed as:		
VRM Class I	0	0
VRM Class II	32,000	0
VRM Class III	< 100	0
VRM Class IV	0	0

Impacts from Land Use Authorization Actions

Land use authorizations can involve building structures. The presence of structures can detract from the visual quality of an area, especially if those structures do not repeat the basic elements of the landscape. Two allocations under the umbrella of land use authorizations are likely to have landscape-level impacts to visual resources: utility right-of-way (ROW) corridors and expected wind energy developments.

Areas identified as utility ROW corridors were compared spatially to the Visual Resource Inventory (VRI) Class for those areas. Based on current demand for utility ROW corridors, it was assumed that development would occur in all identified corridors over the life of the plan. Such development is assumed to decrease the VRI Class by adding structures to the landscape. All Utility ROW Corridors, except Saylor Creek, had existing developments in place (overhead and buried) when the VRI was conducted. Visual objectives for VRM Classes would, for new co-located facilities, meet specified design standards for siting and design.

Land use authorization allocations allowing wind energy development could also impact visual resources. Wind towers do not often repeat the basic elements of the landscape. Wind energy development also involves ancillary features such as roads, structures, and transmission lines that also impact visual resources. Areas available for wind energy development with high wind resource potential (i.e., expected wind energy development areas) were compared spatially to VRI Classes for those areas. Due to current interest in wind energy, it was assumed that these areas would have wind energy development over the life of the plan. Such development is assumed to decrease the VRI Class.

The following indicator was used to analyze the impacts of Land Use Authorization actions on visual resources:

- Visual Resource Inventory (VRI).

Impacts from Management Specific to the No Action Alternative

Utility ROW corridors are expected to occur on 29,000 acres over the life of the plan under the No Action Alternative. Of these, none are VRI Class I or VRI Class II, less than 1% are VRI Class III, and nearly 100% are VRI Class IV.

Wind energy development is expected to occur on 111,000 acres over the life of the plan under the No Action Alternative. Of these acres, none are VRI Class I, 13% are VRI Class II, 18% are VRI Class III, and 69% are VRI Class IV. This development would decrease the visual quality of those acres through the addition of structures; however the impacts to VRI Class II acres would be more severe than to VRI Class IV acres.

Table 4-289 displays the number of acres in utility ROW corridors and expected energy areas for each VRI Class in the No Action Alternative. The No Action Alternative would have the fewest VRI Class I and Class II acres within utility ROW corridors than any of the alternatives. While none of the alternatives

would have VRI Class I lands available for wind energy development, the No Action Alternative would have the second highest acreage of VRI Class II lands available for wind energy development.

Table 4-289. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in the No Action Alternative (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	0	0	200	29,000
Expected Wind Energy Development Areas	0	14,000	20,000	77,000

Impacts from Management Specific to Alternative I

Utility ROW corridors would potentially occur on 53,000 acres over the life of the plan under Alternative I. Of these acres, less than 1% are VRI Class I, 4% are VRI Class II, less than 1% are VRI Class III, and 95% are VRI Class IV. This development would decrease the visual quality of those acres through the addition of structures; however the impacts to VRI Class I acres would be more severe than to VRI Class IV acres.

Wind energy development is expected to occur on 39,000 acres over the life of the plan under Alternative I. Of the acres where wind energy development is expected, none are VRI Class I, less than 1% are VRI Class II, 5% are VRI Class III, and 95% are VRI Class IV. This development would decrease the visual quality of those acres through the addition of structures; however, the impacts to VRI Class II acres would be more severe than to VRI Class IV acres.

Table 4-290 displays the number of acres in utility ROW corridors and expected wind energy development areas for each VRI Class in Alternative I. More VRI Class I acres would be within utility ROW corridors than in the No Action Alternative, less than Alternative VI, and the same amount as Alternatives II, III, IV, and V. Alternative I would have fewer VRI Class II acres available for wind energy development than the No Action Alternative and Alternatives II and III, a similar number available as Alternative IV, and more acres available than Alternatives V and VI.

Table 4-290. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in Alternative I (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	200	2,000	300	50,000
Expected Wind Energy Development Areas	0	300	2,000	37,000

Impacts from Management Specific to Alternative II

Utility ROW corridors would potentially occur on 53,000 acres under Alternative II. Impact from utility ROW corridors on visual resources would be the same as described in Alternative I.

Wind energy development is expected to occur on 127,000 acres over the life of the plan under Alternative II. Of these acres none are VRI Class I, 17% are VRI Class II, 18% are VRI Class III, and 65% are VRI Class IV. This development would decrease the visual quality of those acres through the addition of structures; however the impacts to VRI Class II acres would be more severe than to VRI Class IV acres.

Table 4-291 displays the number of acres in utility ROW corridors and expected wind energy development areas for each VRI Class in Alternative II. More VRI Class I acres would be within utility ROW corridors than in the No Action Alternative, but the number of acres available would be the same as the other action alternatives, except Alternative VI which has more. Alternative II would have the same VRI Class II acres available for utility development as Alternatives I, III, IV, and V, and more than the No Action Alternative and Alternative VI. Alternative II would have more VRI Class II acres available for wind energy development than any other alternative.

Table 4-291. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in Alternative II (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	200	2,000	300	50,000
Expected Wind Energy Development Areas	0	22,000	23,000	82,000

Impacts from Management Specific to Alternative III

Utility ROW corridors would potentially occur on 53,000 acres over the life of the plan under Alternative III. Impact from utility ROW corridors on visual resources would be the same as described in Alternative I.

Wind energy development is expected to occur on 50,000 acres over the life of the plan under Alternative III. Of these acres, none are VRI Class I, 16% are VRI Class II, 6% are VRI Class III, and 78% are VRI Class IV. This development would decrease the visual quality of those acres through the addition of structures; however the impacts to VRI Class II acres would be more severe than to VRI Class IV acres.

Table 4-292 displays the number of acres in utility ROW corridors and expected wind energy development for each VRI Class in Alternative III. More VRI Class I acres would be available for development than in the No Action Alternative, but the number of acres available would be the same as the other action alternatives, except Alternative VI. Alternative III would have the third highest acreage of VRI Class II lands available for wind energy development.

Table 4-292. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in Alternative III (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	200	2,000	300	50,000
Expected Wind Energy Development Areas	0	8,000	3,000	39,000

Impacts from Management Specific to Alternative IV

Utility Row corridors would potentially occur on 53,000 acres in Alternative IV. Impact from utility ROW corridors on visual resources would be the same as described in Alternative I.

Wind energy development could potentially occur on 37,000 acres over the life of the plan under Alternative IV. Of these acres where wind energy development is expected, none are VRI Class I or VRI Class II, 8% are VRI Class III, and 92% are VRI Class IV.

Table 4-293 displays the number of acres in utility ROW corridors and expected wind energy development areas for each VRI Class in Alternative IV. More VRI Class I acres would be within utility ROW corridors than in the No Action Alternative, but the number of acres available would be the same as the other action alternatives, except Alternative VI. Alternatives IV, V, and VI would have the fewest VRI Class I and II acres available for wind energy development.

Table 4-293. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in Alternative IV (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	200	2,000	300	50,000
Expected Wind Energy Development Areas	0	0	3,000	34,000

Impacts from Management Specific to Alternative V

Utility ROW corridors would potentially occur on 53,000 acres in Alternative V. Impact from utility ROW corridors on visual resources would be the same as described in Alternative I.

Wind energy development could potentially occur on 31,000 acres over the life of the plan under Alternative IV. Of these acres, none are VRI Class I or II, 6% are VRI Class III, and 94% are VRI Class IV.

Table 4-294 displays the number of acres in utility ROW corridors and expected wind energy development areas for each VRI Class in Alternative V. More VRI Class I acres would be within utility ROW corridors than in the No Action Alternative, but the number of acres available would be the same as the other action alternatives, except Alternative VI. Alternatives IV, V, and VI would have the fewest VRI Class I and II acres available for wind energy development.

Table 4-294. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in Alternative V (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	200	2,000	300	50,000
Expected Wind Energy Development Areas	0	0	2,000	29,000

Impacts from Management Specific to Alternative VI (Proposed RMP)

Utility ROW Corridors would potentially occur on 35,000 acres in Alternative VI. Of these acres, 1% are VRI Class I, none are VRI Class II, 1% are VRI Class III, and 98% are VRI Class IV. This development would decrease the visual quality of those acres through the addition of structures; however the impacts to VRI Class I acres would be more severe than to VRI Class IV acres.

Wind energy development could potentially occur on 22,000 acres over the life of the plan under Alternative VI. Of these acres, none are VRI Class I or II, 5% are VRI Class III, and 95% are VRI Class IV.

Table 4-295 displays the number of acres in utility ROW corridors and expected wind energy development areas for each VRI Class in Alternative VI. More VRI Class I acres would be within utility ROW corridors than in the No Action Alternative and other action alternatives. Alternatives IV and VI would have the fewest VRI Class I and II acres available for wind energy development.

Table 4-295. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas by Visual Resource Inventory Class in Alternative VI (Proposed RMP) (Acres)

Development Area	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
Utility ROW Corridors	300	0	500	34,000
Expected Wind Energy Development Areas	0	0	1,000	21,000

Impacts from Areas of Critical Environmental Concern Actions

Scenic values are included in the evaluation for relevant and important values when determining whether an area meets the criteria for Area of Critical Environmental Concern (ACEC) management. Three ACEC nominations included scenic values: the Bruneau-Jarbidge ACEC, Salmon Falls Creek ACEC, and Upper Bruneau Canyon ACEC. Relevant and important scenic values were identified on 3,000 acres in the Salmon Falls Creek area; Bruneau-Jarbidge 85,000 acres, Expanded Bruneau-Jarbidge 123,000, Reduced Bruneau-Jarbidge 57,000 acres, and the Upper Bruneau Canyon 18,000 acres.

The following indicator was used to analyze the impacts of Areas of Critical Environmental Concern actions on visual resources:

- Visual Resource Management (VRM).

Impacts from Management Specific to the No Action Alternative

The No Action Alternative directs 3,000 acres with relevant and important scenic values to be managed as the Salmon Falls Creek ACEC and 85,000 acres to be managed as the Bruneau-Jarbidge ACEC. Of the 88,000 acres under ACEC management, 74% are in Visual Resource Management (VRM) Class I.

The No Action Alternative manages 89% of lands with relevant and important scenic values in VRM Class I or II.

Table 4-296. Areas of Critical Environmental Concern by Visual Resource Management Class in the No Action Alternative (Acres)

ACEC	VRM Class I	VRM Class II	VRM Class III	VRM Class IV
Salmon Falls Creek ACEC	0	3,000	0	0
Bruneau-Jarbidge ACEC	65,000	10,000	5,000	5,000

Impacts from Management Specific to Alternative I

Alternative I directs 3,000 acres with relevant and important scenic values to be managed as the Salmon Falls Creek ACEC and 85,000 acres to be managed as the Bruneau-Jarbidge ACEC. Of the 88,000 acres with scenic values under ACEC management, 98% are in VRM Class I or II.

Table 4-297. Areas of Critical Environmental Concern by Visual Resource Management Class in Alternative I (Acres)

ACEC	VRM Class I	VRM Class II	VRM Class III	VRM Class IV
Salmon Falls Creek ACEC	3,000	0	100	0
Bruneau-Jarbidge ACEC	83,000	600	2,000	0

Impacts from Management Specific to Alternative II

Alternative II does not provide ACEC management for any acres with relevant and important scenic values.

Impacts from Management Specific to Alternative III

Alternative III directs 3,000 acres with relevant and important scenic values to be managed as the Salmon Falls Creek ACEC and 57,000 acres to be managed as the Reduced Bruneau-Jarbidge ACEC. Of the 60,000 acres under ACEC management, 100% are in VRM Class I. Along with Alternative VI, Alternative III has the highest percentage of lands with ACEC management with relevant and important scenic values in VRM Class I.

Table 4-298. Areas of Critical Environmental Concern by Visual Resource Management Class in Alternative III (Acres)

ACEC	VRM Class I	VRM Class II	VRM Class III	VRM Class IV
Salmon Falls Creek ACEC	3,000	0	110	0
Reduced Bruneau-Jarbidge ACEC	57,000	0	0	100

Impacts from Management Specific to Alternative IV

Alternative IV directs 123,000 acres with relevant and important scenic values to be managed as the Expanded Bruneau-Jarbidge ACEC. Of the acres under ACEC management, 98% are in VRM Class I.

Table 4-299. Areas of Critical Environmental Concern by Visual Resource Management Class in Alternative IV

ACEC	VRM Class I	VRM Class II	VRM Class III	VRM Class IV
Expanded Bruneau-Jarbidge ACEC	121,000	500	2,000	0

Impacts from Management Specific to Alternative V

Alternative V does not provide for management of the Bruneau-Jarbidge or Salmon Falls Creek ACECs. Instead, those areas are included in the Sagebrush Sea ACEC, which does not include specific management for scenic values.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI directs 3,000 acres with relevant and important scenic values to be managed as the Salmon Falls Creek ACEC and 18,000 acres to be managed as the Upper Bruneau Canyon ACEC. Of the 21,000 acres under ACEC management, 100% are in VRM Class I. Along with Alternative III, Alternative VI has the highest percentage of lands with ACEC management with relevant and important scenic values in VRM Class I.

Table 4-300. Areas of Critical Environmental Concern by Visual Resource Management Class in Alternative VI (Proposed RMP)

ACEC	VRM Class I	VRM Class II	VRM Class III	VRM Class IV
Upper Bruneau Canyon ACEC	18,000	0	0	0
Salmon Falls Creek ACEC	3,000	0	100	0

Summary of Direct and Indirect Impacts

Table 4-301 through Table 4-304 summarize the impacts of the alternatives on lands in Visual Resource Inventory (VRI) Classes. Decisions regarding ACEC management are captured in decisions related to Visual Resource Management (VRM) Classes and land use authorizations.

Table 4-301. Impacts to Visual Resource Inventory Class I Lands by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
VRM Classes							
VRM Class I	62,000	70,000	70,000	70,000	71,000	70,000	70,000
VRM Class II	8,000[A]	0	0	0	0	0	0
VRM Class III	0	200[B]	200[B]	200[B]	200[B]	200[B]	200[B]
VRM Class IV	0	0	0	0	0	0	0
Lands with Wilderness Characteristics							
Managed for Wilderness Characteristics	0	2,000	0	0	1,000	3,000	0
Land Use Authorizations							
Utility Right-of-Way (ROW) Corridors	0	200	200	200	200	200	300
Expected Wind Energy Development Areas	0	0	0	0	0	0	0

[A]VRM Classes in the No Action Alternative are the same VRM Classes in the 1987 Jarbidge RMP, regardless of VRI Classes.
[B]VRI Class I areas managed as VRM Class III are within designated ROW utility corridors.

Table 4-302. Impacts to Visual Resource Inventory Class II Lands by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
VRM Classes							
VRM Class I	37,000	21,000	0	1,000	45,000	0	7,000
VRM Class II	26,000	55,000	2,000	2,000	35,000	83,000	44,000
VRM Class III	12,000	3,000	9,000	67,000	10,000	5,000	21,000
VRM Class IV	16,000	12,000	80,000	21,000	1000	3,000	19,000
Lands with Wilderness Characteristics							
Managed for Wilderness Characteristics	0	30,000	0	0	12,000	55,000	0

	Alternative						
	No Action	I	II	III	IV	V	VI
Land Use Authorizations							
Utility ROW Corridors	0	2,000	2,000	2,000	2,000	2,000	0
Expected Wind Energy Development	14,000	300	22,000	8,000	0	0	0

Table 4-303. Impacts to Visual Resource Inventory Class III Lands by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
VRM Classes							
VRM Class I	2,000	1,000	0	0	2,000	0	0
VRM Class II	18,000	47,000	1,000	1,000	14,000	48,000	3,000
VRM Class III	31,000	3,000	0	50,000	35,000	3,000	48,000
VRM Class IV	< 500	0	50,000	0	0	0	0
Lands with Wilderness Characteristics							
Managed for Wilderness Characteristics	0	2,000	0	0	12,000	14,000	0
Land Use Authorizations							
Utility Right-of-Way (ROW) Corridors	200	300	300	300	300	300	500
Expected Wind Energy Development Areas	20,000	2,000	23,000	3,000	3,000	2,000	1,000

Table 4-304. Impacts to Visual Resource Inventory Class IV Lands by Alternative (Acres)

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
VRM Classes								
VRM Class I	28,000	15,000	0	0	10,000		0	9,000
VRM Class II	59,000	89,000	6,000	6,000	20,000		170,000	33,000
VRM Class III	242,000	135,000	16,000	228,000	329,000	297,000	640,000	179,000
VRM Class IV	830,000	920,000	1,137,000	925,000	800,000	832,000	349,000	938,000
Lands with Wilderness Characteristics								
Managed for Wilderness Characteristics	0	18,000	0	0	12,000		32,000	0
Land Use Authorizations								
Utility ROW Corridors	29,000	50,000	50,000	50,000	50,000		50,000	34,000
Expected Wind Energy Development	77,000	37,000	82,000	39,000	34,000		29,000	21,000

Each of the relationships described in the tables offer a different layer of protection for overlapping acres. VRM Classes determine the amount of change allowed in a landscape, protection for wilderness characteristics limit the existence of structures in the landscape, and management for land use authorizations determine whether specific structures can be placed in an area. Considering these relationships together, the most protective management an area would receive would be to be in VRM Class I or II, have management for wilderness characteristics if they are present, and prohibit utility ROW corridors or wind energy development. Because VRI Class I and II lands are the most sensitive, these

lands were examined to determine the number of acres that would receive the most protective management within each alternative.

Impacts from the No Action Alternative

Of the 70,000 acres of VRI Class I lands, 89% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 40% would receive the highest level of protection as VRM Class I. The No Action Alternative would not manage for wilderness characteristics. No areas would be available for land use authorizations in VRI Class I lands, however 14,000 acres would be available in VRI Class II lands. The No Action Alternative would result in moderate adverse impacts to VRI Class II lands as a result of areas open to land use authorizations.

Impacts from Alternative I

Of the 71,000 acres of VRI Class I lands, 99.7% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 23% would receive the highest level of protection as VRM Class I. In areas rated as VRI Class I and II, Alternative I would manage 32,000 acres for wilderness characteristics. Two hundred acres would be available for land use authorizations in VRI Class I lands and 2,300 acres would be available in VRI Class II lands. Alternative I would result in negligible adverse impacts to VRI Class I and minor adverse impacts to VRI Class II lands as a result of areas open to land use authorizations.

Impacts from Alternative II

Of the 70,000 acres of VRI Class I lands, 99.7% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 2% would receive the highest level of protection as VRM Class I. Alternative II would not manage for wilderness characteristics. Two hundred acres would be available for land use authorizations in VRI Class I lands and 24,000 acres would be available in VRI Class II lands. Alternative II would result in negligible adverse impacts to VRI Class I and major adverse impacts to VRI Class II lands as a result of areas open to land use authorizations.

Impacts from Alternative III

Of the 70,000 acres of VRI Class I lands, 99.7% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 1% would receive the highest level of protection as VRM Class I. Alternative III would not manage for wilderness characteristics. Two hundred acres would be available for land use authorizations in VRI Class I lands and 10,000 acres would be available in VRI Class II lands. Alternative III would result in negligible adverse impacts to VRI Class I and minor adverse impacts to VRI Class II lands as a result of areas open to land use authorizations.

Impacts from Alternative IV

Of the 70,000 acres of VRI Class I lands, 99.7% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 49% would receive the highest level of protection as VRM Class I. In areas rated as VRI Class I and II, Alternative IV would manage 13,000 acres for wilderness characteristics. Two hundred acres would be available for land use authorizations in VRI Class I lands and 2,000 acres would be available in VRI Class II lands. Alternative IV would result in negligible adverse impacts to VRI Class I and Class II lands as a result of areas open to land use authorizations.

Impacts from Alternative V

Of the 70,000 acres of VRI Class I lands, 99.7% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 92% would receive the highest level of protection as VRM Class I. In areas rated as VRI Class I and II, Alternative V would manage 58,000 acres for wilderness characteristics. Two hundred acres would be available for land use authorizations in VRI Class I lands and 2,000 acres would be available in VRI Class II lands. Alternative V would result in negligible adverse impacts to VRI Class I and Class II lands as a result of areas open to land use authorizations.

Impacts from Alternative VI (Proposed RMP)

Of the 70,000 acres of VRI Class I lands, 99.7% would receive the highest level of protection as VRM Class I. Of the 91,000 acres of VRI Class II lands, 8% would receive the highest level of protection as VRM Class I. Alternative VI would not manage for wilderness characteristics. Three hundred acres would be available for land use authorizations in VRI Class I lands and no area would be available in VRI Class II lands. Alternative VI would result in negligible adverse impacts to VRI Class I and minor adverse impacts to VRI Class II lands.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area for visual resources includes BLM-managed lands and lands not managed by the BLM within the planning area. These lands were used as the unit of analysis because impacts from management actions under all the alternatives are not expected to have cumulative influence beyond this scale.

The planning area did not have a Visual Resource Inventory (VRI) prior to the 2008 and the updated 2012 inventory. Past BLM authorizations in the planning area such as powerlines, radio towers, cell towers, livestock tanks, fence, and US Air Force emitter sites have altered visual resources, but were done in accordance with the visual resource management in the 1987 RMP.

Present and reasonably foreseeable actions for the planning area involve those actions that occur on lands not managed by the BLM. These actions include management for visual resources in the planning area. The 2008 VRI took into account the visual resources on lands not managed by the BLM.

Table 4-305. Visual Resource Inventory Classes for All Lands in the Planning Area in 2008

Land Status	VRI I	VRI II	VRI III	VRI IV
BLM-Managed Lands	70,000	91,000	51,000	1,159,000
Lands Not Managed by the BLM	4,000	28,000	28,000	381,000
Total	**74,000**	**119,000**	**79,000**	**1,540,000**

For the analysis of cumulative impacts on visual resources, assumptions were made regarding the management of lands not managed by the BLM within the planning area boundary. The assumption was that these lands would be managed by the landowner for use; this management would be similar to Visual Resource Management (VRM) Class IV. Of these lands, 4,000 acres were VRI Class I, 28,000 acres were VRI Class II, 28,000 acres were VRI Class III, and 381,000 acres were VRI Class IV.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

The analysis of cumulative impacts for the No Action Alternative identifies an increase in the number of acres in VRM Class IV. For Visual Resource Inventory (VRI) Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 36% of those in VRM Class IV are managed by the BLM; 64% are not managed by the BLM. For VRI Class III lands, none of the lands in VRM Class IV are managed by the BLM; 100% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. The No Action Alternative has the fourth largest cumulative impact on VRI Class I, II, and III lands.

Table 4-306. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in the No Action Alternative (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	62,000	37,000	2,000	28,000
VRM Class II	8,000	26,000	18,000	59,000
VRM Class III	0	12,000	31,000	242,000
VRM Class IV	4,000	44,000	28,000	1,211,000

Cumulative Impacts from Alternative I

The analysis of cumulative impacts for Alternative I identifies an increase in the number of acres in VRM Class IV. For VRI Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 30% of those managed in VRM Class IV are managed by the BLM; 70% are not managed by the BLM. For VRI Class III lands, none of the lands in VRM Class IV are managed by the BLM; 100% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. Alternative I has the third largest cumulative impact on VRI Class I, II, and III lands.

Table 4-307. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in Alternative I (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	21,000	1,000	15,000
VRM Class II	0	55,000	47,000	89,000
VRM Class III	200	3,000	3,000	135,000
VRM Class IV	4,000	40,000	28,000	1,301,000

Cumulative Impacts from Alternative II

The analysis of cumulative impacts for Alternative II identifies an increase in the number of acres in VRM Class IV. For VRI Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 74% of those lands managed in VRM Class IV are managed by the BLM; 26% are not managed by the BLM. For VRI Class III lands, 64% of the lands in VRM Class IV are managed by the BLM; 36% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. Alternative II has the least cumulative impact on Class I, II, and III lands.

Table 4-308. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in Alternative II (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	0	0	0
VRM Class II	0	2,000	1,000	6,000
VRM Class III	200	9,000	0	16,000
VRM Class IV	4,000	108,000	78,000	1,518,000

Cumulative Impacts from Alternative III

The analysis of cumulative impacts for Alternative III identifies an increase in the number of acres in VRM Class IV. For VRI Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 40% of those lands in VRM Class IV are managed by the BLM; 60% are not managed by the BLM. For VRI Class III lands, none of the lands in VRM Class IV are managed by the BLM; 100% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. Alternative III has the second least cumulative impact on VRI Class I, II, and III lands.

Table 4-309. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in Alternative III (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	1,000	0	0
VRM Class II	0	2,000	1,000	6,000
VRM Class III	200	67,000	50,000	228,000
VRM Class IV	4,000	49,000	28,000	1,306,000

Cumulative Impacts from Alternative IV

The analysis of cumulative impacts for Alternative IV identifies an increase in the number of acres in VRM Class IV. For VRI Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 3% of those lands in VRM Class IV are managed by the BLM; 97% are not managed by the BLM. For VRI Class III lands, none of the lands in VRM Class IV are managed by the BLM; 100% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. Alternative IV has the largest cumulative impact on VRI Class I, II, and III lands.

Table 4-310. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in Alternative IV (Acres)

VRM Class		VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I		70,000	45,000	2,000	10,000
VRM Class II		0	35,000	14,000	20,000
VRM Class III	Alternative IV-A	200	10,000	35,000	329,000
	Alternative IV-B				297,000
VRM Class IV	Alternative IV-A	4,000	29,000	28,000	1,181,000
	Alternative IV-B				1,213,000

Cumulative Impacts from Alternative V

The analysis of cumulative impacts for Alternative V identifies an increase in the number of acres in VRM Class IV. For VRI Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 10% of those lands in VRM Class IV are managed by the BLM, 90% are not managed by the BLM. For VRI Class III lands, none of the lands in VRM Class IV are managed by the BLM; 100% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. Alternative V has the second largest cumulative impact on VRI Class I, II, and III lands.

Table 4-311. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in Alternative V (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	0	0	0
VRM Class II	0	83,000	48,000	170,000
VRM Class III	200	5,000	3,000	640,000
VRM Class IV	4,000	31,000	28,000	730,000

Cumulative Impacts from Alternative VI (Proposed RMP)

The analysis of cumulative impacts for Alternative VI identifies an increase in the number of acres in VRM Class IV. For VRI Class I lands, none of the lands managed in VRM Class IV are managed by the BLM. For VRI Class II lands, 38% of those lands in VRM Class IV are managed by the BLM; 62% are not managed by the BLM. For VRI Class III lands, none of the lands in VRM Class IV are managed by the BLM; 100% are not managed by the BLM. Management on non BLM-managed lands has more impact to visual resources than management on BLM-managed lands. Alternative VI has the third least cumulative impact on VRI Class I, II, and III lands.

Table 4-312. Visual Resource Management Classes by Visual Resource Inventory Class for All Lands in the Planning Area in Alternative VI (Proposed RMP) (Acres)

VRM Class	VRI Class I	VRI Class II	VRI Class III	VRI Class IV
VRM Class I	70,000	7,000	0	9,000
VRM Class II	0	44,000	3,000	33,000
VRM Class III	200	21,000	48,000	179,000
VRM Class IV	4,000	47,000	28,000	1,319,000

4.3.14. Lands with Wilderness Characteristics

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to Lands with Wilderness Characteristics:

- **Acres with naturalness -** Generally appears to have been affected primarily by the forces of nature.
- **Acres with opportunities for solitude and primitive, unconfined recreation -** Opportunities for primitive, unconfined recreation are affected by the availability, or non-availability, of landscapes free of surface disturbing activities and the sights and sounds of human uses and their developments.

These indicators were selected for Lands with Wilderness Characteristics because they represent the values required for an area to be considered.

Methods and Assumptions

Impacts to Lands with Wilderness Characteristics from management in the following sections of Chapter 2 were analyzed in detail: *Lands with Wilderness Characteristics*, *Visual Resources*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Land Use Authorizations*, and *Minerals*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for Lands with Wilderness Characteristics. Impacts from management for Lands with Wilderness Characteristics can be found under *Impacts from Lands with Wilderness Characteristics Actions* in the *Geologic Features*, *Visual Resources*, *Recreation,* and *Wilderness* sections.

The planning area contains eighteen areas (104,000 acres) outside the Bruneau-Jarbidge Rivers Wilderness and the Lower Salmon Falls Creek Wilderness Study Area (WSA) that possess wilderness characteristics. Although the BLM does not consider identification or designation of new wilderness or WSAs in this document, it does consider whether Lands with Wilderness Characteristics would be managed for those values and how these characteristics would be impacted by resource and resource use allocations and actions. To the extent possible, these impacts are quantified by overlaying use allocations with the Lands with Wilderness Characteristics using geographic information system data layers.

There is no established significance threshold for the loss of wilderness characteristics outside of designated wilderness or WSAs. For the purpose of this analysis and for the comparison of alternatives, any change to individual wilderness characteristics that would result in the value being diminished or no longer present within an area is considered to decrease or remove wilderness character. Impacts of each alternative are analyzed and described only on those Lands with Wilderness Characteristics outside wilderness or the WSA identified and described in Chapters 2 and 3.

Direct and Indirect Impacts

Impacts from Lands with Wilderness Characteristics Actions

The following indicators were used to analyze the impacts of Lands with Wilderness Characteristics actions on Lands with Wilderness Characteristics:

- Acres with naturalness and
- Acres with opportunities for solitude and primitive, unconfined recreation.

Table 4-313 displays the number of acres outside wilderness and the Wilderness Study Area (WSA) that would be managed for wilderness character under each alternative.

Table 4-313. Lands with Wilderness Characteristics by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
Acres Managed for Wilderness Character	0	52,000	0	0	37,000	104,000	0

Impacts from Management Specific to the No Action Alternative and Alternatives II, III, and VI (Proposed RMP)

The No Action Alternative and Alternatives II, III, and VI would not manage any lands outside wilderness and the WSA to maintain wilderness characteristics. Absence of this management would allow decreases to the naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation in areas that currently possess wilderness characteristics.

Impacts from Management Specific to Alternative I

Alternative I would manage six areas of Lands with Wilderness Characteristics to retain their naturalness and to provide opportunities for primitive recreational activities and solitude: Columbet Table, Crater Hole, East Fork Jarbidge, Hole in the Ground, Larios Camp, and Long Draw (52,000 acres). Management that would maintain wilderness character in this area includes: retain Federal ownership (Land Tenure Zone 1); Visual Resource Management Class II; closure to motorized vehicles; closure to leasable and salable mineral exploration or development; allowance for range infrastructure to protect or enhance wilderness characteristics; and allocation for right-of-way avoidance would maintain wilderness character in these six areas.

The remaining twelve areas with wilderness characteristics (Antelope Canyon, Antelope Pocket 1, Antelope Pocket 2, Black Canyon 2011, Browns Bench, China Creek, Indian Hot Springs, Inside Lakes, Roberson Trail, Sheepshead, Twin Lakes, and Winter Camp; 52,000 acres) would be managed for other resources and uses that would not be compatible with maintaining wilderness characteristics. As a result, naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation would likely decrease.

Impacts from Management Specific to Alternative IV

Alternative IV would manage six areas of Lands with Wilderness Characteristics to retain their undeveloped character and to provide opportunities for primitive recreational activities and solitude: Antelope Canyon, Antelope Pocket 1, Antelope Pocket 2, Black Canyon 2011, Browns Bench, and China Creek (37,000 acres). Management to protect these areas would be the same as described in Alternative I.

The remaining twelve areas with wilderness characteristics (Columbet Table, Crater Hole, East Fork Jarbidge, Hole in the Ground, Indian Hot Springs, Inside Lakes, Larios Camp, Long Draw, Roberson Trail, Sheepshead, Twin Lakes, and Winter Camp; 67,000 acres) would be managed for other resources and uses that would not be compatible with maintaining wilderness characteristics. As a result, naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation would likely decrease.

Impacts from Management Specific to Alternative V

Alternative V would manage all eighteen areas of Lands with Wilderness Characteristics to retain their naturalness and to provide opportunities for primitive recreational activities and solitude (104,000 acres). As a result, wilderness characteristics would be maintained in these areas.

Impacts from Visual Resource Actions

The following indicator was used to analyze the impacts of Visual Resource actions on Lands with Wilderness Characteristics:

- Acres with naturalness.

Scenic values contribute to the naturalness of an area and are an important component of wilderness characteristics. Scenic values include the aesthetic of the natural landscape, the presence of native vegetation, and the absence of infrastructure and imprint of human activity. Visual Resource Management (VRM) Classes allow or disallow actions that have the potential to impact the scenic value of Lands with Wilderness Characteristics. The more the VRM Class would retain the existing character of an area, the more likely the scenic values contributing toward naturalness of an area would be retained. Because VRM Classes I and II would retain the existing visual landscape of the area, naturalness in areas allocated to VRM Class I or II would be maintained. Conversely, because VRM Classes III and IV would allow for more substantial visual modifications, naturalness in areas allocated to VRM Class III or IV would decrease. Table 4-314 displays the VRM Class for Lands with Wilderness Characteristics outside wilderness or the Wilderness Study Area by alternative.

Table 4-314. Visual Resource Management Class for Lands with Wilderness Characteristics by Alternative (Acres)

VRM Class	Alternative						
	No Action	I	II	III	IV	V	VI
I	36,000	28,000	3,000	4,000	48,000	3,000	18,000
II	18,000	61,000	0	0	36,000	100,000	15,000
III	27,000	1,000	100	80,000	18,000	1,000	50,000
IV	23,000	14,000	101,000	20,000	2,000	0	21,000

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 86% of Lands with Wilderness Characteristics would be managed to retain their existing visual character, which would result in maintaining their naturalness. More substantial visual modifications would be allowed on the remaining 14% of Lands with Wilderness Characteristics; if these modifications were to occur, naturalness would decrease in these areas.

Impacts from Management Specific to Alternative I

In Alternative I, 49% of Lands with Wilderness Characteristics would be managed to retain their existing visual character, which would result in maintaining their naturalness. More substantial visual modifications would be allowed on the remaining 51% of Lands with Wilderness Characteristics; if these modifications were to occur, naturalness would decrease in these areas.

Impacts from Management Specific to Alternatives II and III

In Alternatives II and III, 3% to 4% of Lands with Wilderness Characteristics would be managed to retain their existing visual character, which would result in maintaining their naturalness. More substantial visual modifications would be allowed on the remaining 96% to 97% of Lands with Wilderness Characteristics; if these modifications were to occur, naturalness would decrease in these areas.

Impacts from Management Specific to Alternative IV

In Alternative IV, 81% of Lands with Wilderness Characteristics would be managed to retain their existing visual character, which would result in maintaining their naturalness. More substantial visual modifications would be allowed on the remaining 19% of Lands with Wilderness Characteristics; if these modifications were to occur, naturalness would decrease in these areas.

Impacts from Management Specific to Alternative V

In Alternative V, 99% of Lands with Wilderness Characteristics would be managed to retain their existing visual character, which would result in maintaining their naturalness. More substantial visual modifications would be allowed on the remaining 1% of Lands with Wilderness Characteristics; if these modifications were to occur, naturalness would decrease in these areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 32% of Lands with Wilderness Characteristics would be managed to retain their existing visual character, which would result in maintaining their naturalness. More substantial visual modifications

would be allowed on the remaining 68% of Lands with Wilderness Characteristics; if these modifications were to occur, naturalness would decrease in these areas.

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on Lands with Wilderness Characteristics:

- Acres with naturalness and
- Acres with opportunities for solitude and primitive, unconfined recreation.

Livestock grazing can impact wilderness characteristics through changes in naturalness such as presence of sheep or cattle, reduced vegetation cover, trampling or trailing, changes in species composition, soil compaction, and impacts to water quality. The presence of livestock does not necessarily preclude the existence of wilderness characteristics. However, the stocking density, infrastructure, and vegetation and soil disturbances resulting from grazing activities can contribute to changes in wilderness characteristics. Table 4-315 displays areas with wilderness characteristics outside wilderness or the Wilderness Study Area available and unavailable for livestock grazing by alternative.

Table 4-315. Lands with Wilderness Characteristics Available and Unavailable for Livestock Grazing by Alternative (Acres)

Livestock Grazing Management	Alternative						
	No Action	I	II	III	IV	V	VI
Unavailable for Livestock Grazing	7,000	8,000	7,000	7,000	8,000	32,000	7,000
Available for Livestock Grazing	97,000	96,000	96,000	96,000	96,000	72,000	96,000

Range infrastructure such as fences, pipelines, and water developments can impact the naturalness of the area depending on how visually prominent they are. Maintenance and construction of range improvements can also result in changes in naturalness and opportunities for solitude. Conversely, rangeland infrastructure can be designed and placed to enhance wilderness characteristics. For example, perimeter fencing would limit the presence of livestock, or a spring development could contribute to off-site watering. These impacts will be considered where specified.

Impacts from Management Specific to the No Action Alternative and Alternatives II and III

In the No Action Alternative and Alternatives II and III, between 92% and 93% of Lands with Wilderness Characteristics would be available for livestock grazing and associated infrastructure development. Because Lands with Wilderness Characteristics would not be managed to maintain wilderness characteristics, construction and maintenance of fences, pipelines, and other livestock-related facilities would be allowed that would decrease the opportunities for solitude or primitive, unconfined recreation by increasing the potential for human contact and for the use of motorized vehicles associated with livestock operations. The degree of naturalness in these areas would decrease by increasing the number of man-made structures, such as fences and holding facilities, or evidence of construction of improvements, such as pipelines.

Impacts from Management Specific to Alternative I

In Alternative I, 92% of Lands with Wilderness Characteristics would be available for livestock grazing. The portions of Lands with Wilderness Characteristics within the Bruneau or Jarbidge Canyons would be unavailable for livestock grazing. The closure of these areas would maintain the existing degree of naturalness and opportunities for solitude.

This alternative would allow construction and maintenance of range infrastructure on a case-by-case basis, consistent with maintenance of existing wilderness characteristics within the managed Lands with

Wilderness Characteristics. This would have no impact to naturalness, or the opportunities for solitude and primitive, unconfined recreation in these areas.

Areas not managed to maintain their wilderness character and naturalness would potentially decrease by allowing range improvements and development, such as fences and holding facilities, or evidence of construction of improvements, such as pipelines. The opportunities for solitude and primitive, unconfined recreation would also decrease in these areas due to increased human contact and use of motorized vehicles.

Impacts from Management Specific to Alternative IV

In Alternative IV, 92% of Lands with Wilderness Characteristics would be available for livestock grazing. This alternative would allow construction and maintenance of range infrastructure on a case-by-case basis, consistent with maintenance of existing wilderness characteristics within the managed Lands with Wilderness Characteristics. This would have no impact to naturalness or the opportunities for solitude and primitive, unconfined recreation in these areas.

Impacts from Management Specific to Alternative V

In Alternative V, 68% of Lands with Wilderness Characteristics would be available for livestock grazing. The portions of Lands with Wilderness Characteristics within the Bruneau or Jarbidge Canyons would be unavailable for livestock grazing. The closure of these areas would also maintain the existing degree of naturalness and opportunities for solitude where applicable.

This alternative would allow construction and maintenance of range infrastructure on a case-by-case basis, consistent with maintenance of existing wilderness characteristics within all eighteen areas with wilderness characteristics. This would have no impact to naturalness or the opportunities for solitude and primitive, unconfined recreation in these areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 92% of Lands with Wilderness Characteristics would be available for livestock grazing. The portions of Lands with Wilderness Characteristics within the Bruneau or Jarbidge Canyons would be unavailable for livestock grazing. The closure of these areas would help maintain the existing degree of naturalness and opportunities for solitude.

This alternative would allow construction and maintenance of range infrastructure to promote livestock distribution or management. Because none of the eighteen areas with wilderness characteristics would be managed to maintain their wilderness character, naturalness in these areas would potentially decrease by allowing range improvements and development, such as fences and holding facilities, or evidence of construction of improvements, such as pipelines. The opportunities for solitude and primitive, unconfined recreation would also decrease in these areas due to increased likelihood of human contact and use of motorized vehicles associated with livestock operations.

Impacts from Recreation Actions

The following indicators were used to analyze the impacts of Recreation actions on Lands with Wilderness Characteristics:

- Acres with naturalness and
- Acres with opportunities for solitude and primitive, unconfined recreation.

Wilderness characteristics include opportunities for solitude and primitive, unconfined recreation. A primitive or unconfined recreational experience includes dispersed, undeveloped recreation activities that do not require developed facilities or use of motorized equipment. Recreational activities that fit this description include hiking, primitive camping, hunting, fishing, viewing wildlife and natural scenery, whitewater boating, mountain biking, and equestrian use. Special Recreation Management Areas (SRMAs) that manage for these types of experiences would tend to maintain wilderness characteristics, while SRMAs and Extensive Recreation Management Areas (ERMAs) that focus on more developed recreational experiences would decrease wilderness characteristics.

Because lands not designated as Recreation Management Areas (RMAs) involve custodial management and are not managed for any particular recreational activity, activities in these areas would be more likely to result in a decrease in wilderness characteristics than in an SRMA or ERMA managed for a primitive setting. Recreation in lands not designated as RMAs are not managed in a way that would restrict or limit certain activities to maintain a particular setting. The absence of recreation management consistent with preservation of wilderness characteristics could allow for impacts resulting from motorized/mechanized recreation, large groups, or placement of developed facilities.

Table 4-316 displays recreation management within Lands with Wilderness Characteristics outside wilderness or the Wilderness Study Area (WSA).

Table 4-316. Recreation Management in Lands with Wilderness Characteristics by Alternative (Acres)

Recreation Management	Alternative						
	No Action	I	II	III	IV	V	VI
SRMA Managed for Primitive Recreation	0	52,000	0	0	49,000	0	0
ERMA Managed for Primitive Recreation	NA	NA	NA	NA	NA	NA	82,000
Lands not Designated as RMAs	104,000	52,000	104,000	104,000	55,000	104,000	22,000

Impacts from Management Specific to the No Action Alternative and Alternatives II and III

The No Action Alternative and Alternatives II and III would not designate SRMAs on Lands with Wilderness Characteristics; all of these areas would be managed as lands not designated as RMAs. Recreational activities within the areas such as motorized and mechanized vehicle use (e.g., all-terrain vehicle and motorcycle riding) and group recreational activities would decrease naturalness or the opportunities for solitude and primitive, unconfined recreation.

Impacts from Management Specific to Alternative I

Nine of the Lands with Wilderness Characteristics occur within the Canyonlands and Jarbidge Foothills SRMAs (50%). These SRMAs would be managed to promote undeveloped recreational use and non-motorized recreation, such as wildlife and scenery viewing, hunting, hiking, equestrian activities, and primitive camping. As a result, management and use of these SRMAs would maintain naturalness and the opportunities for solitude and primitive, unconfined recreation within these nine areas with wilderness characteristics outside wilderness and the WSA. The remaining nine Lands with Wilderness Characteristics would be managed as lands not designated as RMAs (50%); although the areas would be closed to motorized vehicle use, the impacts from recreation in these areas would be the similar as those described for the No Action Alternative because mechanized vehicle use and group recreational activities would be allowed.

Impacts from Management Specific to Alternative IV

Six of the Lands with Wilderness Characteristics occur within the Canyonlands SRMA. As in Alternative I, the management of the Canyonlands SRMA focuses on promoting undeveloped recreational use and non-motorized recreation. This management would maintain naturalness and the opportunities for solitude and primitive, unconfined recreation in these Lands with Wilderness Characteristics areas (33%). The remaining twelve Lands with Wilderness Characteristics would be managed as lands not designated as RMAs (67%); although the areas would be closed to motorized vehicle use, the impacts from recreation in these areas would be the similar as those described for the No Action Alternative because mechanized vehicle use and group activities would be allowed.

Impacts from Management Specific to Alternative V

All eighteen Lands with Wilderness Characteristicss would be managed to protect wilderness characteristics in Alternative V. This management would maintain naturalness and the opportunities for

solitude and primitive, unconfined recreation in all Lands with Wilderness Characteristics areas. No SRMAs would be designated where Lands with Wilderness Characteristics are located in this alternative. The impacts from recreation in these areas would be the similar as those described for the No Action Alternative because mechanized vehicle use and group activities would be allowed.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would not designate SRMAs on Lands with Wilderness Characteristics. However, 82,000 acres of Lands with Wilderness Characteristics in the Jarbidge Foothills and Canyonlands would be designated as ERMAs. This would offer a level of management that would benefit naturalness and the opportunities for solitude and primitive, unconfined recreation in these acres (e.g. travel designations, Visual Resource Management Classes, type(s) of activities, and locations where Special Recreation Permits would be issued or not issued). The remaining 22,000 acres of Lands with Wilderness Characteristics lands not designated as RMAs would have similar recreation impacts as the No Action Alternative.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions on Lands with Wilderness Characteristics:

- Acres with naturalness and
- Acres with opportunities for solitude and primitive, unconfined recreation.

Impacts to wilderness characteristics from transportation and travel management actions can be analyzed by the presence of routes or evidence of cross-country travel, which ultimately leads to a decrease in naturalness. The use of motorized vehicles both on and off designated routes decreases opportunities for solitude. In addition, because the Lands with Wilderness Characteristics do not contain transportation routes, allocating these areas as limited to designated routes provides an opportunity to create new routes within these areas. Transportation management that closes areas to motorized vehicle use in Lands with Wilderness Characteristics is anticipated to maintain those characteristics. Table 4-317 displays the transportation and travel allocations within Lands with Wilderness Characteristics.

Table 4-317. Travel Designations within Lands with Wilderness Characteristics by Alternative (Acres)

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Open to Cross-Country Motorized Vehicle Use	37,000	0	0	0	0	0	0
Limited to Designated Routes	67,000	52,000	104,000	104,000	67,000	0	104,000
Closed to Motorized Vehicle Use	0	52,000	0	0	37,000	104,000	0

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would designate the Lands with Wilderness Characteristics characteristics as open to cross-country motorized vehicle use or limited to designated routes depending on location, resources, and resource protections. The limitations within this alternative would be:

- All recreational motorized and mechanized off-highway vehicles (excluding snowmobiles) are limited to existing roads and trails (due to the Omnibus Public Land Management Act of 2009) in the following inventoried Lands with Wilderness Characteristics:
    - Columbet Table, Crater Hole, East Fork Jarbidge, Hole in the Ground, Indian Hot Springs, Inside Lakes, Larios Camp, Long Draw, Roberson Trail, Sheepshead, Twin Lakes, and Winter Camp areas.

- Portions of Black Canyon 2011, China Creek, and Browns Bench areas:
  - Seasonal limitations to over the snow vehicles in crucial mule deer and antelope winter range.
- Areas that would be open to cross-country motorized use include:
  - Antelope Pocket 1, Antelope Pocket 2, and Antelope Canyon.

Travel that is limited (seasonally or by statue) in areas with wilderness characteristics would serve to maintain naturalness and opportunities for solitude and primitive, unconfined recreation. Areas designated as open would continue to allow motorized cross-country travel, essentially decreasing the wilderness character.

Impacts from Management Specific to Alternative I

Under Alternative I, the Lands with Wilderness Characteristics managed for wilderness characteristics (Columbet Table, Crater Hole, East Fork Jarbidge, Hole-in-the-Ground, Larios Camp, and Long Draw) would be closed to motorized vehicle use. These actions would maintain naturalness and opportunities for solitude and primitive, unconfined recreation in these areas.

Transportation and travel on other Lands with Wilderness Characteristics but not managed for (52,000 acres) would be limited to designated routes. This would result in a decrease in naturalness due to alteration of vegetation and soil resources and a decrease in opportunities for solitude due to the presence of motorized vehicles and other transportation and travel-related activities.

Impacts from Management Specific to Alternatives II, III, and VI (Proposed RMP)

Under Alternatives II, III, and VI, none of the Lands with Wilderness Characteristics would be managed for wilderness characteristics; therefore, transportation and travel within all eighteen Lands with Wilderness Characteristics would be limited to designated routes; no areas would be open to cross-country motorized vehicle use. Designation of routes for access or fire suppression purposes, and wildland fire prevention would conflict with some existing wilderness characteristics, potentially resulting in a decrease of naturalness, and opportunities for solitude and primitive, unconfined recreation due to changed route locations and increases in motorized vehicle use.

Impacts from Management Specific to Alternative IV

Under Alternative IV, the Lands with Wilderness Characteristics managed for wilderness characteristics (Antelope Canyon, Antelope Pocket 1, Antelope Canyon 2, Black Canyon 2011, Browns Bench, and China Creek; 37,000 acres)would be closed to motorized vehicle use. This action would maintain the degree of naturalness and opportunities for solitude and primitive, unconfined recreation within these areas. Transportation and travel on other lands not managed for wilderness characteristics (67,000 acres) would be limited to designated routes; no areas would be open to cross-country motorized vehicle use. This would result in a decrease in naturalness due to alteration of vegetation and soil resources and a decrease in opportunities for solitude due to the presence of motorized vehicles and other transportation and travel-related activities.

Impacts from Management Specific to Alternative V

Under Alternative V, all eighteen Lands with Wilderness Characteristics would be managed for wilderness characteristics and therefore would be closed to motorized transportation (104,000 acres). This action would maintain the degree of naturalness and opportunities for solitude and primitive, unconfined recreation within these areas.

Impacts from Land Use Authorizations Actions

The following indicators were used to analyze the impacts of Land Use Authorizations actions on Lands with Wilderness Characteristics:

- Acres with naturalness and
- Acres with opportunities for solitude and primitive, unconfined recreation.

Land use authorizations include designation of rights-of-way (ROWs) and other authorizations. These designations can impact wilderness characteristics through surface-disturbing activities and the

development of infrastructure. Impacts to Lands with Wilderness Characteristics from land use authorizations would occur in proportion to available areas with the potential to be developed. Wilderness characteristics are expected to be maintained in areas designated for ROW avoidance or exclusion. Table 4-318 displays Lands with Wilderness Characteristics that have the potential to be developed for wind energy or would be within utility ROW corridors.

Table 4-318. Utility Right-of-Way Corridors and Expected Wind Energy Development Areas in Land with Wilderness Characteristics by Alternative (Acres)

Land Use Authorization	Alternative						
	No Action	I	II	III	IV	V	VI
Expected Energy Wind Development Areas	20,000	0	25,000	2,000	0	0	0
Utility ROW Corridors	1,000	1,000	1,000	1,000	1,000	1,000	0

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would manage the majority of the planning area as available for land use authorizations, including Lands with Wilderness Characteristics. The surface-disturbing activities and infrastructure associated with wind energy developments would impact wilderness characteristics on 20,000 acres. Utility ROW corridors would impact 1,000 acres of the East Fork Jarbidge area. The naturalness of the areas would be impacted by the placement of transportation routes, removal or disturbance of surface vegetation, and development of man-made visual components such as wind turbines, substations, and power lines. Opportunities for solitude would be impacted to varying degrees by the type of development. For example, due to the mechanical systems and necessity for regular operations and maintenance, a concentration of wind turbines would require more frequent human presence than a utility line. Opportunities for primitive, unconfined recreation would be impacted similar to opportunities for solitude, but may also be influenced by increases in transportation routes that might be used by motorized vehicles. Protection fences associated with land use authorizations would also decrease the opportunity for these types of recreational experiences.

Wilderness character would decrease on 21,000 acres, or 20%, of Lands with Wilderness Characteristics due to wind energy and utility development.

Impacts from Management Specific to Alternatives I, IV, and V

The surface-disturbing activities and infrastructure associated with wind energy developments would not impact wilderness characteristics in these three alternatives. Utility development within utility ROW corridors would impact 1,000 acres of the East Fork Jarbidge area. The specific impacts associated with these developments would be similar to those described in the No Action Alternative, with the much smaller spatial extent of 1% of the Lands with Wilderness Characteristics.

Impacts from Management Specific to Alternative II

The impacts of Alternative II on Lands with Wilderness Characteristics would be similar to those described for the No Action Alternative; however, with 25,000 acres of expected wind energy development and 1,000 acres within utility ROW corridors, the impact footprint would be larger. Wilderness character would decrease on 25% of Lands with Wilderness Characteristics due to wind energy and utility development.

Impacts from Management Specific to Alternative III

The impacts of Alternative III on Lands with Wilderness Characteristics would be similar to those described for the No Action Alternative; however, 2,000 acres potentially affected by wind energy development would be a major decrease in impacted wilderness characteristics. Wilderness character would decrease on 3% of Lands with Wilderness Characteristics due to wind energy and utility development.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The surface-disturbing activities and infrastructure associated with wind energy developments would not impact wilderness characteristics in this alternative. The impacts within the utility ROW corridor in the East Fork Jarbidge (1,000 acres) area would be negligible being it is an ROW avoidance area.

Impacts from Minerals Actions

The following indicators were used to analyze the impacts of Mineral actions on Lands with Wilderness Characteristics:

- Acres with naturalness and
- Acres with opportunities for solitude and primitive, unconfined recreation.

Exploration and development resulting from mineral leasing can impact wilderness characteristics through surface-disturbing activities, site operations, presence of noise and people, and the creation of infrastructure. Mineral development requires the use of existing roads or the creation of new routes to access mining areas as well as surface-disturbing activities and facility development to locate and extract the minerals. Impacts to wilderness characteristics would include decreases in the degree of naturalness through disturbance of vegetation communities, soil resources, and landform; decreases in the opportunities for solitude by increased operations-related activities, noise, and personnel; and decreases in opportunities for primitive, unconfined recreation through increased surface developments and access restrictions or closures. Mineral development restrictions and withdrawals would maintain or preserve wilderness characteristics. The degree of impact related to minerals is relative to the acreage available for developments.

However, according to the Reasonably Foreseeable Development Scenario for oil and gas development (Appendix K), approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Finally, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Leasable Minerals

Surface occupancy for leasable mineral extraction would include some or all of the following developments and activities: removal of surface vegetation, alteration of landforms, construction of new or use of existing transportation routes, heavy equipment operations, presence of personnel, overhead power lines, surface piping, access restrictions and permanent structures. Impacts to naturalness, opportunities for solitude and primitive, unconfined recreation would be relative to the proportion of land that is available for surface occupancy.

The potential oil and gas areas include three Lands with Wilderness Characteristics: Black Canyon 2011, Browns Bench, and China Creek (31,000 acres). Restrictions regarding surface occupancy vary by alternative and have different impacts accordingly. Degrees of impact are measured by the proportion of the potentially affected Lands with Wilderness Characteristics available for any surface occupancy. Where oil or gas leasing and development occur, any surface occupancy would result in a decrease in the wilderness characteristics of that area. Conversely, areas that are closed or open with no surface occupancy restrictions are not anticipated to have a measurable impact to wilderness characteristics.

None of the Lands with Wilderness Characteristics are located within the high or medium potential geothermal areas; therefore, wilderness characteristics in low potential areas are not anticipated to be affected by geothermal exploration and development.

Table 4-319. Leasing Restrictions for Land with Wilderness Characteristics within the Potential Oil and Gas Areas by Alternative (Acres)

Restriction	Alternative						
	No Action	I	II	III	IV	V	VI
No Leasing Restrictions [A]	31,000[C]	29,000	30,000	30,000	0	0	30,000
Leasing Restrictions[B]	73,000[C]	75,000	74,000	74,000	104,000	104,000	74,000

[A] Includes areas open or open with controlled surface use or seasonal restrictions.
[B] Includes areas open with no surface occupancy.
[C] The 1987 Jarbidge RMP had recommended mineral restrictions that were never defined spatially. Without this information, lands that would not be available for development are not clearly identifiable. Therefore, this analysis assumes that all of the Lands with Wilderness Characteristics in the potential oil and gas areas could have oil and gas leasing in the No Action Alternative.

Salable and Locatable Minerals

Salable and locatable mineral development would include some or all of the following activities: removal of surface vegetation, alteration of landforms, construction of new or use of existing transportation routes, heavy equipment operations, presence of personnel, overhead power lines, access restrictions, and permanent structures. Where these developments occur, naturalness and opportunities for solitude and primitive, unconfined recreation would be decreased. Impacts of salable and locatable mineral management are relative to the proportion of Lands with Wilderness Characteristics that would be available for salable and locatable mineral development.

Table 4-320. Salable and Locatable Mineral Allocations in Land with Wilderness Characteristics by Alternative (Acres)

	Alternative						
	No Action [A]	I	II	III	IV	V	VI
Salable Minerals							
Open	104,000	43,000	104,000	97,000	19,000	0	82,000
Closed	0	61,000	0	7,000	85,000	104,000	22,000
Locatable Minerals							
Open	104,000	74,000	98,000	97,000	54,000	98,000	104,000
Withdrawn [B]	0	30,000	6,000	7,000	50,000	6,000	0

[A] The 1987 Jarbidge RMP had some recommended mineral restrictions that were never defined spatially. Without this information, lands that would not be available for salable or locatable mineral development are not clearly identifiable. Therefore, this analysis assumes that all of the Lands with Wilderness Characteristics could have salable or locatable mineral development.
[B] This assumes that all areas recommended for withdrawal from locatable mineral development will be withdrawn.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development. Demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low. Approximately 90 acres of surface disturbance are expected to occur in the planning area as a result of oil and gas exploration and development over the life of the plan. This is less than 0.1% of the potential oil and gas areas that would be available for oil and gas leasing.

Impacts from Management Specific to the No Action Alternative

Management in the No Action Alternative does not specify any of the Lands with Wilderness Characteristics for restrictions or closure to leasable mineral surface occupancy or to salable or locatable mineral development. There are some restrictions related to other resource concerns that would overlap into these areas, which potentially would reduce impacts to wilderness characteristics. However, these areas were never spatially defined. Therefore, it is assumed that 100% of Lands with Wilderness Characteristics would be available for leasable development within the potential oil and gas areas and 100% would be available for locatable and salable mineral development. If these areas were developed

for these uses, activities resulting from leasable, locatable, or salable mineral development would result in a decrease in naturalness and opportunities for solitude and primitive, unconfined recreation.

Impacts from Management Specific to Alternative I

The Black Canyon 2011, Browns Bench, and China Creek areas intersect the potential oil and gas area. Impacts to naturalness and opportunities for solitude and primitive, unconfined recreation would occur on up to 94% of these three areas, as surface occupancy for oil and gas leasing would be allowed. Wilderness characteristics would potentially decrease on 29,000 acres of Lands with Wilderness Characteristics (28%) due to oil and gas leasing.

Areas managed to protect wilderness characteristics would be closed to salable mineral development (52,000 acres), while the remaining Lands with Wilderness Characteristics would be available for salable mineral development. This allows for a potential decrease of naturalness or opportunities for solitude on 50% of the Lands with Wilderness Characteristics.

In Alternative I, 71% of Lands with Wilderness Characteristics would be available for locatable mineral exploration and extraction. This would decrease naturalness and opportunities for solitude and primitive, unconfined recreation where locatable mineral development or entry has occurred. Demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Impacts from Management Specific to Alternative II

Decreases in naturalness and opportunities for solitude and primitive, unconfined recreation would occur on 97% of the Black Canyon 2011, China Creek, and Browns Bench areas, as surface occupancy for oil and gas leasing would be allowed. Wilderness characteristics would potentially decrease on 30,000 acres of Lands with Wilderness Characteristics (29%) due to oil and gas leasing.

All eighteen Lands with Wilderness Characteristics would be available for salable mineral development allowing for potential decreases of naturalness and opportunities for solitude on 100% of these areas.

Locatable mineral exploration and/or extraction would be allowed on 94% of the Lands with Wilderness Characteristics. Decreases in naturalness and opportunities for solitude would be expected where locatable mineral development or entry has occurred.

Impacts from Management Specific to Alternative III

The impacts from leasable mineral management on Lands with Wilderness Characteristics in Alternative III would be identical to those described for Alternative II.

Salable mineral development would be allowed on 93% of Lands with Wilderness Characteristics potentially decreasing naturalness and opportunities for solitude on these areas.

The impacts from locatable mineral management on Lands with Wilderness Characteristics in Alternative III would be similar to those described for Alternative II.

Impacts from Management Specific to Alternative IV

All areas with wilderness characteristics outside the wilderness or Wilderness Study Area would be closed to mineral leasing. As a result, naturalness and opportunities for solitude, and primitive, unconfined recreation that exist in these areas would be maintained.

Eighty five thousand acres would be closed to salable mineral development in Alternative IV. This would maintain or enhance the naturalness, or opportunities for solitude, and primitive, unconfined recreation that exist in these areas.

Areas managed for wilderness characteristics would be closed to salable mineral development, while the lands not managed for wilderness characteristics areas would be available for salable mineral development. This allows for a potential decrease of naturalness or opportunities for solitude on 18% of Lands with Wilderness Characteristics.

Locatable mineral exploration and extraction would be allowed on 52% of the Lands with Wilderness Characteristics. Decreases in naturalness, and opportunities for solitude would be expected where locatable mineral development or entry has occurred.

Impacts from Management Specific to Alternative V

Alternative V would manage all 18 Lands with Wilderness Characteristics (104,000 acres) for their wilderness characteristics. As part of this management, the areas would be closed to leasable and salable mineral development. This would maintain or enhance the naturalness, or opportunities for solitude, and primitive, unconfined recreation that exist in these areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The impacts from leasable mineral management on Lands with Wilderness Characteristics in the Alternative VI would be identical to those described for Alternatives II and III. All Lands with Wilderness Characteristics would be open to locatable mineral development in Alternative VI.

All eighteen Lands with Wilderness Characteristics would be available for salable mineral development, except for 22,000 acres specified for closure for reasons unrelated to wilderness characteristics. This would allow for potential decreases of naturalness and opportunities for solitude on 79% of these areas.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

Management under the No Action Alternative would result in major adverse impacts to Lands with Wilderness Characteristics. The most notable decreases in wilderness characteristics would be expected from the lack of specific management for these values, absence of transportation closures, and few or no restrictions related to land use authorizations or mineral development. The No Action Alternative would maintain various wilderness characteristics through management specified for visual resources.

Impacts from Alternative I

Management under Alternative I would rank second for the protection of wilderness characteristics for Lands with Wilderness Characteristics. Decreases in wilderness characteristics would be expected from the lack of specific management for some of the areas inventoried to contain these values. In addition, these unmanaged Lands with Wilderness Characteristics would be subject to mineral development, land use authorizations, and transportation route designation that would contribute to a decline in wilderness character. However, the recreation management prescribed for this alternative would manage all of the inventoried areas for primitive recreation. This would aid in maintaining wilderness characteristics in these areas. Management under Alternative I would result in moderate adverse impacts to Lands with Wilderness Characteristics.

Impacts from Alternative II

The most notable decreases in wilderness characteristics would be expected from the lack of specific management for these values under Alternative II, absence of transportation closures, and few or no restrictions related to land use authorizations or mineral development. Alternative II contains no management that would indirectly maintain wilderness characteristics. Management under Alternative II would result in major adverse impacts, similar to the No Action Alternative and Alternative III, to Lands with Wilderness Characteristics.

Impacts from Alternative III

The most notable decreases in wilderness characteristics would be expected from the lack of specific management for these values, absence of transportation closures, and few or no restrictions related to mineral development under Alternative III. Management actions contained in Alternative III that would aid in maintaining wilderness characteristics are the expected wind energy and utility right-of-way corridor development restrictions. Management under Alternative III would result in major adverse impacts, similar to the No Action Alternative and Alternative II, to Lands with Wilderness Characteristics.

Impacts from Alternative IV

Alternative IV ranks third for the protection of wilderness characteristics for Lands with Wilderness Characteristics. This alternative on lands inventoried for wilderness characteristics is similar to Alternative I. Management under Alternative IV would result in minor to moderate adverse impacts to Lands with Wilderness Characteristics.

Impacts from Alternative V

Alternative V ranks first for the protection of wilderness characteristics for Lands with Wilderness Characteristics. This alternative would manage all lands inventoried for wilderness characteristics. Management under Alternative V would result in no adverse impacts to Lands with Wilderness Characteristics.

Impacts from Alternative VI (Proposed RMP)

Alternative VI ranks fourth for the protection of wilderness characteristics for Lands with Wilderness Characteristics and would be similar to those described for Alternative III. However; 82,000 acres would be managed as an Extensive Recreation Management Area and more protection would be provided by Visual Resource Management Classes I and II in the Alternative VI. Overall, wilderness characteristics would be adversely effected due to salable and locatable mineral allocations.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area includes wilderness and Wilderness Study Area (WSA) Lands with Wilderness Characteristics within and adjacent to the planning area. This is a general representation of the current regional area inventoried to have wilderness characteristics from the perspective of the users that would typically benefit from other resources or uses within the planning area.

Past, present, and reasonably foreseeable actions for the following resource cumulatively affects wilderness characteristics:

- Wilderness Characteristics.

Table 4-321. Lands with Direct Management for Wilderness Characteristics in the Region

Designation	Name	Acres
BLM – Bruneau and Jarbidge Field Offices		
Wilderness Study Area	Lower Salmon Falls Creek WSA	4,000
Designated Wilderness	Bruneau-Jarbidge Rivers Wilderness	90,000
	Little Jacks Creek Wilderness	51,000
	Big Jacks Creek Wilderness	53,000
USFS – Humboldt Toiyabe National Forest		
Designated Wilderness	Jarbidge Wilderness	113,000
Total		**311,000**

Decisions that would continue to maintain or enhance wilderness characteristics would not increase overall wilderness acreage, but would rather maintain these lands and associated character as they currently exist. Decisions that would place resource use management actions over the management of existing wilderness characteristics would lead to a decrease in overall regional acreage that support wilderness character.

Summary of Cumulative Impacts

The BLM can make a variety of land use decisions to protect wilderness characteristics, such as travel and transportation planning, Area of Critical Environmental Concern designation, wildlife habitat restoration, or site specific recreation plans. These decisions and plans normally include application of Visual Resource Management objectives to guide placement of roads, trails, and other facilities;

establishing conditions of use to be attached to permits, leases, and other authorizations to achieve the desired level of resource protection. All comprehensive and activity-based planning efforts and implementation of such plans can serve to protect wilderness characteristics generally over the long term.

Cumulative Impacts from the No Action Alternative and Alternatives II, III, and VI (Proposed RMP)

Not managing the eighteen inventoried Lands with Wilderness Characteristics for those characteristics would allow activities to occur in these areas that would result in the reduction of acres with wilderness character. Increased use of motorized vehicles due to both a continuing growth in population and a continuing popularity and developing technology in recreational off-road vehicles will continue. A decrease in opportunities for solitude would occur with increases in noise and human encounters. These actions would result in an overall reduction in the regional acres with wilderness characteristics.

Cumulative Impacts from Alternative I

Alternative I would manage six of the eighteen inventoried Lands with Wilderness Characteristics to maintain those characteristics. This would add a level of protective management to 52,000 acres determined to have a high degree of naturalness and opportunities for solitude and primitive, unconfined recreation that are not currently managed for those values.

Overall, selection of Alternative I would result in 50% of the areas with wilderness characteristics within the planning area being managed to maintain those characteristics. Naturalness and opportunities for solitude and primitive, unconfined recreation in the remaining 50% would likely decrease.

Cumulative Impacts from Alternative IV

Alternative IV would manage six inventoried Lands with Wilderness Characteristics to maintain those characteristics. This would add a level of protective management to 37,000 acres determined to have naturalness and opportunities for solitude and primitive, unconfined recreation that are not currently managed for those values.

Overall, selection of Alternative IV would result in 36% of the areas with wilderness characteristics within the planning area being managed to maintain those characteristics. Naturalness and opportunities for solitude and primitive, unconfined recreation in the remaining 63% would likely decrease.

Cumulative Impacts from Alternative V

Alternative V would manage all eighteen inventoried Lands with Wilderness Characteristics to maintain those characteristics. This would add a level of protective management to 104,000 acres determined to have naturalness and opportunities for solitude and primitive, unconfined recreation that are not currently managed for those values.

Overall, selection of this alternative would result in 100% of the areas with wilderness characteristics within the planning area being managed to maintain those characteristics, 50% more than Alternative I and 63% more than in Alternative IV.

4.4. RESOURCE USES

4.4.1. Livestock Grazing

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to livestock grazing:

- **Availability of forage for livestock grazing** – Federal Land Policy and Management Act of 1976 identifies one of the outcomes of public lands management as providing food for domestic animals (Section 102[8]) and recognizes domestic livestock grazing as a principal or major use of public lands (Section 103[l]). There are multiple aspects of availability of forage for livestock that can be affected by management contained within the alternatives. For example, the amount of vegetation allocated for use by livestock affects *how much* forage is available for livestock; allocation of areas available or unavailable for livestock grazing affects *where* forage is available; and restrictions on season of use or rest following wildland fire or vegetation treatments affect *when* forage is available. In this analysis, the assessment of impacts addresses all of these aspects of forage availability.
- **Restrictions on infrastructure for livestock management** – Range infrastructure includes fences, water developments, and other infrastructure used to manage authorized livestock grazing to meet resource objectives. Typically, range infrastructure is installed to enhance or improve livestock grazing management and reduce conflicts with resources by controlling livestock movement and the timing and duration of grazing periods. Restrictions on infrastructure would make managing livestock to meet the terms and conditions of a permit more difficult and potentially more costly.

Methods and Assumptions

Impacts to livestock grazing from management in the following sections of Chapter 2 were analyzed in detail: *Livestock Grazing*, *Vegetation Communities* (including *Upland Vegetation* and *Riparian Areas and Wetlands*), *Special Status Species*, *Wildland Fire Ecology and Management*, *Wild Horses*, *Transportation and Travel*, *Land Use Authorizations*, *Leasable Minerals*, and *Areas of Critical Environmental Concern*. Impacts from management in the *Noxious Weeds and Invasive Plants* section were not analyzed in detail because the impacts were captured in the analysis of upland vegetation actions. Impacts from management in the remaining sections were not analyzed in detail because the management did not impact livestock grazing. Impacts from management for livestock grazing can be found under *Impacts from Livestock Grazing Management* in the *Climate Change*, *Soil Resources*, *Water Resources*, *Upland Vegetation*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Plants*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Wild Horses*, *Cultural Resources*, *Lands with Wilderness Characteristics*, *National Historic Trails*, *Wilderness*, *Social Conditions*, and *Economic Conditions* sections.

The amount of forage available for livestock grazing is given in animal unit months (AUMs). An AUM is the amount of forage that a cow and her calf would consume during a 30-day period and is defined as 800 pounds of air-dried forage. Each alternative would allocate areas available for livestock grazing and a percent of vegetation production for livestock at the planning level and would be over the life of the plan. Vegetation allocations prescribed in Chapter 2 would be determined within the range of vegetation production described for each alternative. Management actions that affect available forage that limit seasons of use, utilization limits, or use of infrastructure will be considered in determining the appropriate percentage of vegetation to be allocation to livestock grazing. The effects of these management actions are discussion for each alternative.

AUMs available for livestock at initial implementation of the plan were calculated for each alternative based on the vegetation allocation, areas available for livestock grazing for that alternative, and the 2006 vegetation production data (the most recent year for which production data are available). Calculations of AUMs available at full implementation of the plan for each alternative were based on the vegetation

composition of the planning area if the alternative's vegetation treatment objectives are achieved. These AUM calculations are provided solely for analysis purposes. The actual number of AUMs allowed will be determined for each allotment during the permit renewal process. The availability of temporary non-renewable (TNR) permits of AUMs in addition to AUMs allocated to 10-year permits and would be subject to criteria described in each alternative. TNR permits would be determined on a yearly basis depending upon forage production and would be analyzed in an allotment-level analysis.

The following assumptions were made when analyzing impacts to livestock grazing:

- Livestock grazing is and would continue to be managed in accordance with Fundamentals of Rangeland Health (43 CFR 4180.1).
- Changes in resource condition would be identified through monitoring according to current BLM protocols.
- Livestock management changes would be made on an allotment- or pasture-specific basis to achieve resource objectives.
- Construction, use, and maintenance of range infrastructure (e.g., fences, pipelines, wells, troughs, and reservoirs) would result in localized loss of vegetation cover throughout the life of the infrastructure.
- Range infrastructure would continue to be used as a tool to maintain, meet, or make progress toward meeting Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management.
- Cattle and sheep are the primary livestock considered under livestock grazing. Although some areas are more suitable for different kinds and classes of livestock, impacts of livestock use are considered to be similar regardless of kind or class and will not be discussed separately in this analysis.
- Areas where domestic sheep grazing conflicts with bighorn sheep are discussed separately in the *Special Status Wildlife* section.
- Seasonal and yearly fluctuations in forage may result in adjusting authorized livestock AUMs on a yearly basis within pastures, but allocation of forage for an allotment would be determined at a level that would not require adjustments except to respond to wildland fire or drought.
- Wildland fire is an episodic event and can result in short-term reduction in available AUMs. On average over the life of the plan, locations identified as critical suppression areas would be less likely to burn and fire size and intensity/severity would be smaller than for conditional suppression areas.
- All vegetation treatments prescribed to meet resource objectives (e.g., upland vegetation, special status species, and wildland fire ecology and management) would be met over the life of the plan.
- Permitted AUMs allocated to livestock grazing would be determined on an allotment-specific basis and reflect the impacts of the following:
  - Acres available or unavailable for grazing (e.g., reference areas, Areas of Critical Environmental Concern (ACECs);
  - Percent of vegetation production types allocated for livestock; and
  - Acres of vegetation sub-group (e.g., perennial vs. annual, native vs. non-native, shrub over-story).

Direct and Indirect Impacts

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

Forage availability can be influenced by the acres available to livestock grazing, allocation of vegetation production, the type of vegetation, and season of use. When allocating forage, priority is given to watershed, wildlife, wild horses, and livestock, in that order. The AUMs available for livestock grazing at the planning area scale depend on three factors: how much area is available for livestock grazing, the percent of each vegetation type allocated for livestock, and the amount of each vegetation type available

(acres). AUMs would typically increase if more areas are available for grazing, a higher percent of vegetation is allocated for livestock, or the acres of more productive vegetation types increases. Table 4-319 displays the acres available and AUMs available for livestock grazing for each alternative.

Table 4-322. Acres and Forage Available for Livestock Grazing by Alternative

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Acres Available for Livestock Grazing [A]	1,412,000	1,389,000	1,408,000	1,407,000	1,324,000	1,355,000	1,160,000	1,406,000
Acres Unavailable for Livestock Grazing[B]	51,000	74,000	55,000	56,000	139,000	108,000	303,000	57,000
AUMs at Initial Implementation of the RMP[C]	200,000	189,000 to 259,000	350,000 to 423,000	273,000 to 344,000	94,000 to 147,000	97,000 to 151,000	46,000 to 93,000	216,000 to 326,000
AUM Following Full Implementation of the RMP[C]	160,000 to 260,000	179,000 to 245,000	362,000 to 440,000	276,000 to 348,000	78,000 to 123,000	81,000 to 127,000	42,000 to 85,000	186,000 to 279,000
Change in AUMs Following Full Plan Implementation	**-40,000 to +60,000**	**-10,000 to -14,000**	**+12,000 to +17,000**	**+3,000 to +4,000**	**-16,000 to -24,000**	**-16,000 to -24,000**	**-4,000 to -8,000**	**-30,000 to -47,000**

[A] Acres include the portions of the Saylor Creek Training Range managed by the BLM for livestock grazing.
[B] See allocation of areas available/unavailable to livestock grazing in Chapter 2 for details.
[C] For Alternatives I through VI, AUMs at initial implementation of the plan are an estimate of forage that would be available for livestock based on the vegetation allocation and the areas available for livestock grazing by alternative, combined with the 2006 vegetation production data. The AUMs for Alternatives I through VI are estimates of forage availability and are provided to assist the reader in comparing the effects of the alternatives. The number of AUMs available within the planning area may actually be more or less than what is represented when project-level analysis of grazing permits is completed but would remain within the range of allocation percentages described.

Limitations on infrastructure (e.g., water development, fences) would directly affect the ability to control spatial distribution of livestock grazing, and indirectly affect the amount of effort needed by permittees to control timing and duration. As complexity of managing authorized grazing to meet resource goals and objectives increase, the effort by livestock permittees would increase.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, 1,412,000 acres (97%) of the planning area would be available for livestock grazing and 51,000 acres (3%) would be unavailable. The majority of the acres unavailable for grazing are in canyons and wildlife tracts. The No Action Alternative would initially allocate approximately 200,000 AUMs to livestock grazing and change to between 160,000 and 260,000 AUMs following full implementation of the plan.

Reserve Common Allotments would not be established in the No Action Alternative. Not creating Reserve Common Allotments would decrease options for permittees to access alternative forage during vegetation treatments, following wildland fire, or periods of drought.

The No Action Alternative places fewer restrictions on livestock grazing that would affect availability of forage due to special status species habitat or life cycle considerations relative to all action alternatives.

The following actions could result in a reduction in forage availability because they would involve allotment-specific adjustments of the timing and amount of forage available:

- Incorporating forage or cover requirements specific to areas of primary wildlife use.
- Adjusting livestock season of use in multiple use areas (MUAs) 10, 15, and 16 to resolve conflicts on mule deer, pronghorn, and bighorn sheep ranges.

The following actions result in restrictions on infrastructure for livestock grazing:

- Designing new spring developments and modifying selected existing spring developments to protect wetted areas.
- Modifying fences to allow for pronghorn and mule deer passage in areas where their needs are not being met in MUAs 7, 11, 12, 13, and 16.
- Modifying other fences where specific wildlife needs are not being met.
- Building new fences to allow for wildlife passage.

Impacts from Management Common to All Action Alternatives

Drought management guidelines would result in temporary reductions of forage availability during times of drought to maintain rangeland health and long-term productivity by restricting seasons-of-use, lengths of stay, extended rest periods, and reduced utilization levels.

Restrictions would be placed on infrastructure for livestock grazing with regard to aquatic and riparian objectives; special status species; and the application of BLM-approved design features, construction and maintenance practices. Restrictions on infrastructure could affect the ability to achieve the higher range of allocations by not allowing new pipelines or other water sources to be developed in areas currently too distant from water for forage to be readily accessible.

Impacts from Management Specific to Alternative I

The acres available for livestock grazing would be 1,389,000 acres, 95% of the planning area. The majority of the acres unavailable for grazing are lands associated with canyons, reference areas, and wildlife tracts. Alternative I would initially allocate between 189,000 and 259,000 AUMs and potentially decrease to between 179,000 and 245,000 AUMs following full implementation of the plan.

Reserve Common Allotments would not be established.

Temporary non-renewable (TNR) permit authorizations during years when vegetation production creates additional forage would increase available forage to livestock grazing. Along with Alternative III, Alternative I would allow TNR permits on fewer acres at initial implementation than Alternatives II and VI, but more acres than Alternatives IV and V. As Alternative I vegetation treatments are implemented and vegetation sub-groups (VSGs) change from non-native to native communities, the pastures available for TNR permits may change in accordance to qualifying criteria (see Chapter 2.3.3.1, *Livestock Grazing*).

Alternative I would place more restrictions related to wildlife cover and life cycle requirements (breeding, nesting, and fawning/calving) that limit forage availability relative to the No Action Alternative and Alternatives II and III.

- Seasons-of-use would be adjusted in the Bruneau-Jarbidge Area of Critical Environmental Concern (ACEC) so livestock grazing does not overlap bighorn sheep breeding and winter periods.
- Pastures would be managed to provide a variety of cover to ground nesting birds.

In areas available to livestock, grazing would be restricted on big game winter range with native shrublands from November 15 through April 30.

Alternative I would contain restrictions on new and existing water developments, locations of salting/supplements in upland game bird and sage-grouse habitat, and locations of cultural or historic importance. This would result in an increase in infrastructure restrictions compared to the No Action Alternative and Alternative II but similar to Alternatives III, IV, V, and VI.

Impacts from Management Specific to Alternative II

Under Alternative II, 1,408,000 acres (96%) of the planning area would be available for livestock grazing and 54,000 acres (4%) would be unavailable. The majority of the acres unavailable for grazing are in areas not in allotments such as canyons, wildlife tracts, and reference areas.

Alternative II would initially allocate between 350,000 and 423,000 AUMs to livestock grazing, and potentially increase to between 362,000 and 440,000 AUMs following full implementation of upland vegetation objectives. Allocations under this alternative would likely lead to higher forage availability than in the other alternatives.

Relative to the other alternatives, a large portion of the annual grass production would be allocated for livestock grazing. Because of the unpredictable nature of production of annual grasses (Vallentine and Stevens, 1994), this allocation of annual grasses would result in wide fluctuations in yearly stocking rates and lengths of grazing periods. Livestock operators with permits in allotments containing high amounts of annual grass production would be required to make annual adjustments to numbers of livestock to match production.

Reserve Common Allotments would be established to provide permittees an alternative source of forage to temporarily replace forage unavailable on their allotments due to wildland fire, vegetation treatment projects, or drought. Reserve Common Allotments would be established in allotments where permits are relinquished, or cancelled. Forage availability for allotments with active permits would not be decreased.

Alternative II would allow TNR permits in more pastures than Alternatives I, III, IV, V, and VI. The pastures available for TNR permits would not change as vegetation treatments are implemented over the life of the plan since VSGs would not be a criterion for TNR permits (see Chapter 2, *Livestock Grazing*). However, the higher allocation of vegetation production in this alternative would likely limit the occurrence of excess forage that would be available to livestock grazing under a TNR permit authorization.

Alternative II places fewer restrictions on livestock grazing for wildlife habitat or life cycle considerations that would affect availability of forage compared to all the other action alternatives.

- There would be no date restrictions for livestock grazing on big game winter range available to livestock grazing.
- Restrictions to provide cover to ground nesting birds would be limited to pastures with more than 50% native plant communities, the same as Alternative III and less than Alternatives I, IV, V, and VI. The degree this management action would decrease forage availability would be allotment-specific and determined during plan implementation.

Alternative II would contain restrictions on new and existing spring developments, locations of livestock watering facilities, salting/supplements, and holding facilities in areas with cultural resources conflicts; and new water developments in sage-grouse habitat. These increased infrastructure restrictions limit the opportunities to improve distribution of livestock grazing compared to the No Action Alternative. These restrictions would be less than all the other action alternatives.

Impacts from Management Specific to Alternative III

Under Alternative III, 1,407,000 acres (96%) of the planning area would be available for livestock grazing and 56,000 acres (4%) would be unavailable. The majority of the acres unavailable for grazing are canyons, wildlife tracts, and reference areas.

Alternative III would initially allocate between 273,000 and 344,000 AUMs and potentially increase to between 276,000 and 348,000 AUMs following full implementation of upland vegetation objectives. Alternative III has the second highest forage allocation of the action alternatives. The increased forage allocation in Alternative III would be a part of fuels reduction efforts which would also stabilize forage availability in the long term by reducing the risk of wildland fire.

Similar to Alternative II, a large portion of the production of annual grasses would be allocated for livestock grazing. Because of the unpredictable nature of annual grass production, this allocation of

annual grasses would result in wide fluctuations in yearly authorizations. Livestock operators with permits in allotments containing high amounts of annual grass production would be required to make annual adjustments to livestock numbers in order to match production. However, the allocation of annual grass production is less than Alternative II, decreasing difficulties of managing in response to these fluctuations.

Reserve Common Allotments may be established to facilitate vegetation treatment projects and increase the flexibility to mitigate temporary loss of forage available to livestock grazing due to wildland fire, vegetation treatments, or drought. Impacts would be the same as described for Alternative II.

Alternative III would allow TNR permits on fewer acres than Alternatives II and VI, but more acres than Alternatives IV and V. As vegetation treatments are implemented and VSGs change from non-native to native communities, the pastures available for TNR permits may change in accordance to qualifying criteria (see Chapter 2.3.3.1 *Livestock Grazing*). Similar to Alternative II, the initial allocation of forage would be high enough to likely limit the occurrence of additional forage that would potentially be issued under TNR permits.

Alternative III places fewer restrictions on livestock grazing that would affect availability of forage due to wildlife habitat or life cycle considerations than Alternatives I, IV, V, and VI, but more than Alternative II and the No Action Alternative. The degree these actions would affect forage or areas available to livestock grazing would be allotment specific.

- Livestock grazing may be allowed in the winter on big game winter range available to livestock grazing.
- Managing grazing to provide a variety of residual cover heights to meet the needs of ground-nesting birds.
- Livestock grazing south of Sheep Creek would be adjusted so seasons-of-use would not overlap bighorn sheep breeding and winter periods in pastures that contain bighorn sheep habitat.

Restrictions on infrastructure would be similar to Alternative I except emphasis would be to meet suppression and fuels reduction objectives.

- In order to meet resource objectives or aid in wildland fire suppression, new pipelines would be installed and existing reservoirs and wells maintained. By using this infrastructure to aid in wildland fire suppression, restrictions on location and other restrictions may be reduced.
- Pasture and allotment boundaries may be modified to facilitate the use of permitted livestock grazing to achieve fuels reduction objectives; modifications specific to fuels management objectives may decrease efficiency for livestock management.
- Alternative III would contain restrictions on new and existing spring developments; location of new livestock watering facilities, salting/supplements, and holding facilities with regard to canyon rims, playas, protective trail corridors, and areas with cultural resource conflicts, and new and existing watering facilities and salting/supplements in sage-grouse habitat.

Impacts from Management Specific to Alternative IV

Under Alternative IV-A, 1,324,000 acres (90%) would be available for livestock grazing and 139,000 acres (10%) would be unavailable; under Alternative IV-B, 1,355,000 acres (93%) of the planning area would be available for livestock grazing and 108,000 acres (7%) would be unavailable. Areas available for livestock grazing would be fewer than in the other alternatives, with the exception of Alternative V. The majority of the acres unavailable for grazing in Alternative IV are in canyons, the Inside Desert ACEC, wildlife tracts, and reference areas. The difference between IV-A and IV-B in acres available to livestock is the size of the Inside Desert ACEC.

Alternative IV-A would make available between 94,000 and 147,000 AUMs and would potentially decrease to between 78,000 and 123,000 following full implementation of vegetation treatments and ACEC objectives. In Alternative IV-B, between 97,000 and 151,000 AUMs would be initially allocated and potentially decrease to 81,000 and 127,000 AUMs. This alternative would allocate the least number of AUMs of all the alternatives, with the exception of Alternative V.

Reserve Common Allotments may be established in Alternative IV and would have similar effects as described for Alternative II.

TNR permits would be allowed in fewer pastures than in the other alternatives, with the exception of Alternative V. As vegetation treatments are implemented to restore native plant communities, the pastures available for TNR permits would likely decrease.

Alternative IV places more restrictions related to special status species habitat or life cycle considerations on livestock grazing that would affect availability of forage, relative to all alternatives except Alternative V. The following actions result in a reduction in forage availability because they would involve allotment-specific adjustments to the timing and amount of forage available. The degree of decrease would be allotment-specific and determined during plan implementation:

- Livestock grazing may be allowed in the winter on big game winter range available to livestock grazing.
- Providing a variety of residual cover heights to meet the needs of ground-nesting birds.
- Providing adequate cover for big game species during calving, fawning, and lambing.

Restrictions on infrastructure for livestock grazing would be similar to that described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, 1,160,000 acres (79%) of the planning area would be available for livestock grazing and 303,000 acres (21%) would be unavailable. This would be the fewest acres available to livestock grazing of any of the alternatives. The majority of the acres unavailable for grazing are in reference areas, canyons, and the Brown's Bench/China Mountain reference area.

Alternative V would initially allocate between 46,000 and 93,000 AUMs to livestock grazing, and potentially decrease to 42,000 to 85,000 AUMs following full implementation of vegetation treatments and establishment of reference areas. Forage availability would decrease over the life of the plan more than all other alternatives. The affects would vary by allotment depending upon resource objectives (i.e., special status species habitat) and actions such as changes in vegetation through treatments to restore native vegetation communities (see the *Upland Vegetation* section).

Reserve Common Allotments would not be established. Relinquished or cancelled permits would be held over the life of the plan for wildlife habitat and watershed protection. AUMs associated with this action would reduce forage availability in addition to the reduction in initial allocation.

TNR permits would not be allowed in Alternative V, potentially reducing the number of AUMs authorized relative to other alternatives.

Alternative V places the most restrictions on livestock grazing that would affect availability of forage due to wildlife habitat or life cycle considerations.

- Livestock grazing would not be allowed in the winter on the 905,000 acres of big game winter range available to livestock grazing in Alternative V, reducing forage availability for livestock during this season.
- Providing a variety of residual cover heights to meet the needs of ground-nesting birds.
- Livestock grazing would be adjusted so seasons-of-use do not overlap bighorn sheep breeding and winter periods in pastures that contain bighorn sheep habitat.

Restrictions on infrastructure due to wild life habitat or life cycles would be more than in any of the other alternatives, and new pipelines and spring developments would not be authorized. Restrictions on existing infrastructure would be similar to those described for Alternatives I, III, IV, and VI.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 1,406,000 acres (96%) of the planning area would be available for livestock grazing and 57,000 acres (4%) would be unavailable. The majority of the acres unavailable for grazing are lands associated with canyons, wildlife tracts, and areas not in allotments.

Alternative VI would initially allocate between 216,000 and 316,000 AUMs and potentially decrease to between 186,000 and 279,000 AUMs following full implementation of the plan. Forage availability would decrease over the life of the plan. The affects would vary by allotment depending upon resource objectives (i.e., special status species habitat) and actions such as changes in vegetation through treatments to restore native vegetation communities.

Reserve Common Allotments would be established, with impacts similar to those described for Alternative II.

The use of TNR permits in Alternative VI would increase forage availability by allowing TNR permits in more pastures than Alternatives I, III, IV, and V. The pastures available for TNR permits would not change as vegetation treatments are implemented since vegetation composition would not be a criterion for TNR permits. TNR permits would not be allowed in pastures containing areas within the Bruneau-Jarbidge Rivers Wilderness Area.

Restrictions on infrastructure due to actions prescribed to meet wildlife cover and life cycle requirements (breeding, nesting, and fawning/calving) would be similar to those described for Alternatives I and IV and more relative to the No Action Alternative and Alternatives II and III.

Alternative VI would contain restrictions on new and existing water developments, locations of salting/supplements in upland game bird and sage-grouse habitat, and locations of cultural or historic importance. This would result in an increase in infrastructure restrictions compared to the No Action Alternative and Alternative II but similar to Alternatives I, III, IV, and V.

Impacts from Vegetation Communities Actions

The following indicators were used to analyze the impacts of Vegetation Communities actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

Management actions to achieve goals and objectives of maintaining healthy vegetation communities would affect productivity and the ability of the plant community to resist invasive plants. Management actions directly influence the amount of vegetation available for allocation to livestock grazing. Management actions prescribed by alternatives would result in changes in the relative composition of vegetation sub-groups (VSGs) within Vegetation Management Areas. Changes in plant communities from grasslands to shrub-dominated communities (e.g., from Non-Native Perennial to Non-Native Understory VSGs or from Native Grassland to Native Shrubland VSGs) would reduce the amount of grass and forb production through competition for limited resources between shrubs and herbaceous species. Changes from non-native perennial grasslands to native grasslands would also reduce total vegetation production, which would affect the availability of forage for livestock. Non-native and native perennial grasses, relative to annual grasses, provide a stable vegetation base because their annual productivity is likely to fluctuate less with precipitation. Forage availability in areas dominated by annual grasslands is largely dependent upon the amount and timing of precipitation, potentially resulting in wide fluctuations of production from year to year and making the availability of the forage less predictable. As a result, management that reduces the amount of Annual VSG would tend to stabilize forage available for livestock.

All VSGs in the planning area contain at least some of each type of vegetation (e.g., the Native Shrubland VSG also contains small amounts of annual and non-native perennial grasses). Shifts in VSGs will result in shifts in the amount of each vegetation type and, therefore, shifts in the total amount of vegetation

produced in that area. These changes would result in changes to the amount of vegetation available for allocation to livestock grazing.

Management actions for vegetation communities interact with management actions for livestock grazing. Changes from non-native to native plant communities affect forage availability by decreasing the percentage of vegetation production allocated to livestock, and changing seasons-of-use and grazing use criteria. For example, an area that shifts from a community dominated by non-native species to a community dominated by native species would be subject to management specific to native communities and vice versa (e.g., seasons-of-use and utilization).

Other vegetation management actions, such as management for biological soil crusts, reference areas, or riparian areas and wetlands, also affect components of livestock grazing. The effects of these actions on the indicators are discussed below.

Impacts from Management Specific to the No Action Alternative

Vegetation treatment actions described in the No Action Alternative were primarily designed to stabilize soils and increase livestock forage. The effect would be an increase in the relative proportion of non-native perennial communities through conversion of annual communities and removal of shrubs in non-native understory communities.

Table 4-323. Changes in Composition of the Planning Area by Vegetation Sub-Group for the No Action Alternative (Acres)

	VSG						
	Annual	**Non-Native Perennial**	**Non-Native Understory**	**Native Grassland**	**Native Shrubland**	**Unvegetated**	**No Data**
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	120,000	402,000	40,000	476,000	285,000	48,000	1,000

As a result, vegetation production would increase, which would likely increase animal unit months allocated for livestock at the allotment-specific level. The No Action Alternative would identify riparian and watershed functions as a high priority with direction to manage activities to achieve riparian and watershed objectives. This would include periodic rest and closure of riparian areas, which would reduce forage availability in those areas by making them unavailable for livestock grazing until objectives have been met.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives provide direction for protecting existing vegetation and newly treated areas. Direction for allocation and uses of vegetation, particularly during vulnerable periods such as growing seasons, drought, or seeding establishment, would enhance long-term sustainability of the forage base. These actions would result in temporary, short-term reductions in forage availability during and immediately after treatment until objectives have been achieved. Over the long term, vegetation actions are expected to increase the stability of the forage base.

All action alternatives would promote the attainment of riparian goals and objectives throughout the planning area (see Chapter 2, *Riparian Areas and Wetlands*). Riparian Conservation Areas (RCAs) would be identified where riparian resources would receive management emphasis to attain habitat objectives for special status species (USDA, 1995; Quigley and Arbelbide, 1997). This direction is expected to maintain or improve riparian function over the life of the plan.

Riparian management would restore instream conditions and prioritize riparian areas for restoration (Priority 1, 2, and 3) based on habitat condition (HC ratings) and proper functioning condition (PFC ratings) (see *Riparian Areas and Wetlands* section). Management actions and authorized uses in riparian areas identified as HC and PFC restoration reaches would be consistent with achieving objectives to

improve instream (HC) and riparian (PFC) condition. Management actions prescribed to achieve site-specific RCA objectives affect livestock grazing by applying allotment or pasture specific management actions such as limiting areas available to grazing, increasing restrictions on annual use criteria, seasons-of-use, and/or adjustments in the placement of infrastructure (see Chapter 2, *Riparian Areas and Wetlands*). Effects to livestock grazing across the planning area are expected to be spatially limited to RCAs within pastures and allotments. However, exclusion from riparian areas would decrease water availability, indirectly making larger portions of pastures or allotments less accessible for livestock grazing. The creation of riparian reference areas would also occur in all action alternatives, and would locally reduce the miles of riparian area available for grazing.

The effects of these actions would be variable, depending upon the category and priority rating of the stream reaches and the management actions implemented to achieve resource objectives. Management actions that would limit livestock access within RCAs would decrease forage availability. Loss of forage produced in riparian areas themselves would be negligible at the planning level, but depending upon productivity of riparian areas selected for RCAs would have major effects at the pasture level. However, forage production associated with riparian plant communities would not be considered in determining forage allocation for any of the alternatives so establishment of RCAs would no effect allocation. Establishment of RCAs would potentially have the greatest effect on forage availability in adjacent uplands if livestock water within RCAs was limited without providing alternative sources.

Management within RCAs would also limit use of infrastructure for livestock management. New infrastructure would be allowed if achievement of riparian areas and wetlands objectives were enhanced. Existing infrastructure would be evaluated for its function, and ability to help achieve resource objectives. If the presence and use of the infrastructure did not help maintain or achieve resource objectives it would be modified or removed.

Impacts from Management Specific to Alternative I

The effect of actions for upland vegetation would be to increase the relative proportion of native shrubland through conversion of annual, non-native perennial, non-native understory, and native grassland communities. Alternative I would result in more acres of native plant communities than the No Action Alternative and Alternatives II, III, and V, but fewer acres than Alternatives IV and VI. These areas would be subject to criteria appropriate to native plant communities that would affect availability of forage, such as restrictions in seasons-of-use, grazing use criteria, and pastures that would qualify for temporary non-renewable (TNR) permits.

Table 4-324. Changes in Composition of the Planning Area by Vegetation Sub-Group for Alternative I (Acres)

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	78,500	308,000	35,000	243,000	659,000	48,000	0
Percent change from Baseline	**-22%**			**+17%**		**0%**	**NA**

Restoration projects would require periods of rest from grazing resulting in short-term decreases of forage availability while vegetation in treated areas became established. Effects would be minor to moderate at the pasture level, but would be negligible at the planning area.

Achievement of vegetation management objectives over the life of the plan would result in moderate decreases of forage availability due to reduced production of herbaceous vegetation, decreased

allocation levels of native forage and the application of more restrictive management criteria associated with native plant communities.

Seventy-five ungrazed upland reference areas (approximately 160 acres each; 12,000 acres total) and ten ungrazed riparian reference areas (3,000 acres total) would be created to evaluate vegetation response to exclusion from livestock grazing. These reference areas would increase areas unavailable for livestock grazing relative to the No Action Alternative and Alternatives II and III. Acres that would be within reference areas are accounted for in areas unavailable for grazing described in Chapter 2, *Livestock Grazing Allocations*. Where practical, reference areas would be located to take advantage of existing fences or natural barriers to minimize the need for additional new fences. Even so, reference areas would increase the miles of fence present across the planning area, increasing the cost of maintenance and the effort needed to reduce resource conflicts. Riparian reference areas would decrease access to water and forage in riparian areas, shifting livestock use out of riparian areas and into uplands. Loss of access to water in the riparian reference areas would decrease availability of forage in adjacent uplands if alternative water sources were not already available or created.

Management to maintain and enhance biological soil crusts in Native Grassland and Native Shrubland VSGs would restrict forage availability through changes in season of use, stocking rates, and placement of infrastructure. The type and intensity of these effects would be site-specific depending upon soil and vegetation, but would be limited to areas with native shrubland or native grassland communities. As upland vegetation objectives are achieved and perennial communities are restored to native, further reductions on forage availability would occur.

Under Alternative I, management to achieve riparian objectives would likely decrease forage availability through modification of management practices (e.g., changes to season of use and utilization limits), closure of pastures, and exclosure fencing. Effects would range from minor in areas where limitation affected smaller areas, to major where limitation affected larger areas and made higher amounts of forage or areas unavailable to grazing. The effects would vary widely depending upon site-specific conditions and would be primarily at the allotment scale with limited effects across the planning area.

Impacts from Management Specific to Alternative II

The effect of vegetation treatments would be to increase the relative proportion of non-native perennial communities primarily through treatment of annual communities and, to a lesser extent, through treatment of non-native understory communities (see the *Upland Vegetation* section). Alternative II would result in a similar number of acres of native plant communities as the No Action Alternative and Alternative III, but fewer acres than the Alternatives I, IV, V, and VI. These areas would be subject to criteria appropriate to native plant communities that would affect availability of forage, such as restrictions in seasons-of-use, and grazing use criteria. Implementation of vegetation projects would require periods of rest from grazing resulting in short-term decreases of forage availability while vegetation in treated areas became established. Effects would be minor to moderate at the pasture level, but would be negligible at the planning area. Temporary decreases of forage availability would be similar to the No Action Alternative and Alternative III, but fewer than Alternatives I, IV, V, and VI. Manipulation of plant communities to reach upland vegetation objectives would result in an increase of forage availability over the life of the plan.

Table 4-325. Changes in Composition of the Planning Area by Vegetation Sub-Group for Alternative II (Acres)

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	46,000	455,000	41,000	476,000	306,000	48,000	0

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Percent change from Baseline	**+1%**			**0%**		**0%**	**NA**

Fifty-two ungrazed upland reference areas (approximately 40 acres each; 2,000 acres total) and ten ungrazed riparian reference areas (1,000 acres total) would be created to evaluate vegetation response to exclusion from livestock grazing; the fewest of all action alternatives. Where practical, reference areas would be located to take advantage of existing fences or natural barriers to minimize the need for additional new fences. However, the miles of fence present across the planning area would increase, increasing the cost of maintenance and operation. The impacts from creation of riparian reference areas on forage availability would be similar to those described for Alternative I.

Under Alternative II, management to achieve riparian objectives would likely result in decreases of forage availability through modification of management practices (e.g., changes to season of use and utilization) and exclosure fencing. Effects would range from minor to major at the allotment and pasture scale depending upon site-specific conditions, but would have limited effects across the planning area.

Impacts from Management Specific to Alternative III

Alternative III would reduce the amount and continuity of fine fuels throughout the planning area. Alternative III would result in a similar number of acres of native plant communities as the No Action Alternative and Alternative II, but fewer acres than Alternatives I, IV, V, and VI. These areas would be subject to criteria for native plant communities that would affect availability of forage, such as restrictions in seasons-of-use, grazing use criteria, seasonal restrictions to grazing on big game winter range, and pastures that would qualify for TNR permits. Restoration projects would require periods of rest from grazing resulting in short-term decreases of forage availability while vegetation in treated areas become established. Effects would be minor to moderate at the pasture level, but would be negligible at the planning area. Temporary decreases of forage availability would be similar to the No Action Alternative and Alternative II, but fewer than Alternatives I, IV, V, and VI.

Table 4-326. Changes in Composition of the Planning Area by Vegetation Sub-Group for Alternative III (Acres)

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	54,000	425,000	59,000	259,000	507,000	67,000	0
Percent change from Baseline	**-1%**			**-2%**		**+40%**	**NA**

Achievement of vegetation management objectives would result in a minor increase of forage over the life of the plan. However, restoration of native communities would also increase the suitability and occupancy of habitat by special status species or other wildlife species that would likely result in additional restrictions to forage availability and infrastructure to meet habitat requirements.

Seventy-five ungrazed upland reference areas (approximately 40 acres each; 3,000 acres total) and ten ungrazed riparian reference areas (1,000 acres total) would be created to evaluate vegetation response to exclusion from livestock grazing. The impacts from these reference areas would be similar to those described for Alternative II.

Under Alternative III, treatments to achieve riparian objectives would likely result in effects to forage availability through modification of management practices (e.g., changes to season of use and utilization), closing pastures, and exclosure fencing. Effects would range from minor to major depending upon site-specific conditions at the allotment and pasture scale but would have limited effects across the planning area. Effects of managing for PFC would be the same as Alternatives IV, V, and VI.

Impacts from Management Specific to Alternative IV

Alternative IV would create a landscape dominated by connected native shrubland communities. Alternative IV would result in more acres of native plant communities through active restoration than any of the other alternatives. Restoration projects would require periods of rest from grazing resulting in short-term decreases of forage availability while vegetation in treated areas become established. Effects would be minor to moderate at the pasture level, but would be negligible at the planning area.

Table 4-327. Changes in Composition of the Planning Area by Vegetation Sub-Group for Alternative IV (Acres)

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	46,000	161,000	132,000	169,000	816,000	48,000	0
Percent change from Baseline	**-37%**			**+26%**		**0%**	**NA**

Restoration of vegetation to native shrubland would result in moderate decreases of forage availability due to reduced production of herbaceous vegetation, decreased allocation of forage, and application of criteria associated with native plant communities. Restoration of native communities would also increase the suitability and occupancy of habitat by special status species or other wildlife species that would likely result in additional restrictions to forage availability and infrastructure to meet habitat requirements.

Seventy-five ungrazed reference areas (approximately 160 acres each, 12,000 acres total) and ten ungrazed riparian reference areas (3,000 acres total) would be created to evaluate vegetation response to exclusion from livestock grazing. The impacts from these areas would be the same as described for Alternative I.

Under Alternative IV, management to achieve riparian objectives would likely result in decreases to forage availability through modification of management practices (e.g., changes to season of use and utilization), closing pastures, and exclosure fencing. Effects would range from minor to major depending upon site-specific conditions at the allotment and pasture scale but would have limited effects across the planning area. Effects of managing for PFC would be the same as Alternatives III, V, and VI.

Impacts from Management Specific to Alternative V

In Alternative V, the effect of vegetation treatments would be to increase the amount and continuity of communities dominated by shrubs within the planning area through conversion of annual, non-native perennial, and native grassland communities. Alternative V would result in more acres of native plant communities than the No Action Alternative and Alternatives II and III, but fewer acres than Alternatives I,

IV, and VI. These areas would be subject to changes in season of use and grazing use criteria for native plant communities.

Table 4-328. Changes in Composition of the Planning Area by Vegetation Sub-Group for Alternative V (Acres)

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	85,000	157,000	259,000	278,000	545,000	48,000	1,000
Percent change from Baseline	**-7%**			**+5%**		**0%**	**NA**

Achievement of vegetation objectives over the life of the plan would result in moderate decreases of forage availability due to reduced production of herbaceous vegetation, decreased allocation of forage, and application of criteria associated with native plant communities. Restoration would largely be passive so conversion of vegetation communities would be slower than the other alternatives. Adjustments in allocation due to vegetation communities would likewise be slower over time. Required periods of rest from grazing to allow vegetation in treated areas to become established would occur over longer periods of time due to high reliance on passive restoration methods than all other alternatives. Effects would be minor to major at the allotment level, but would be negligible at the planning area. Restoration of native communities would increase the suitability and occupancy of habitat by special status species or other wildlife species that would likely result in additional restrictions to forage availability and infrastructure to meet habitat needs.

Forty ungrazed upland reference areas (193,000 acres total) and six ungrazed riparian reference areas (23,000 acres total) would be created to evaluate vegetation response to exclusion from livestock grazing. The reference areas would consist of an entire pasture, requiring no additional fences. Because the upland exclosures would be large, continuity and efficiency of pasture management in the remainder of the allotments, and potentially adjoining allotments, would be affected by the interruption. Additional operational costs (trucking, longer trailing routes) would likely be incurred to follow scheduled rotations and or maintain infrastructure.

Under Alternative III, management to achieve riparian objectives would likely result in decreased forage availability through modification of management practices (e.g., changes to season of use and utilization), closing pastures, and exclosure fencing at the allotment and pasture scale, but would have limited effects across the planning area. Effects of managing for PFC would be the same as Alternatives III, IV, and VI.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would create a landscape dominated by connected native shrubland communities. Alternative VI would result in more acres of native plant communities through active restoration than any of the other alternatives except Alternative IV. Restoration projects would require periods of rest from grazing resulting in short-term decreases of forage availability while vegetation in treated areas became established. Effects would be minor to moderate at the pasture level, but would be negligible at the planning area.

Table 4-329. Changes in Composition of the Planning Area by Vegetation Sub-Group for Alternative VI (Proposed RMP) (Acres)

	VSG						
	Non-Native			Native		Other	
	Annual	Non-Native Perennial	Non-Native Understory	Native Grassland	Native Shrubland	Unvegetated	No Data
Baseline	125,000	356,000	60,000	476,000	306,000	48,000	1,000
Full Implementation	68,000	199,000	101,000	226,000	729,000	48,000	1,000
Percent change from Baseline	**-32%**			**+22%**		**0%**	**NA**

Achievement of vegetation objective over the life of the plan would result in moderate to major decreases of forage availability due to reduced production of herbaceous vegetation, decreased allocation of forage, and application of criteria associated with native plant communities. Restoration of native communities would also increase the suitability and occupancy of habitat by special status species or other wildlife species that would result in additional restrictions to forage availability and infrastructure.

Up to fifty-two ungrazed reference areas (approximately 40 acres each, 2,080 acres total) and ten ungrazed riparian reference areas (3,000 acres total) would be created to evaluate vegetation response to exclusion of livestock grazing. The impacts from these areas would be the same as described for Alternative III.

Under Alternative VI, management to achieve riparian objectives may result in decreases to forage availability through modification of management practices (e.g., changes to season of use and utilization), closing pastures, and exclosure fencing at the allotment and pasture scale, but would have limited effects across the planning area. Effects of managing for PFC would be the same as Alternatives III, IV, and V.

Impacts from Special Status Species Actions

The following indicators were used to analyze the impacts of Special Status Species actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

Special status species habitat management would impact forage availability by affecting allocation of forage, areas available for grazing, and limiting grazing management practices such as season of use or annual use criteria (utilization or residual limitations). Best management practices specific to special status species also apply restrictions on infrastructure (Appendices B and D). Due to their limited range, management of special status species habitat is expected to reduce forage availability and restrict infrastructure at the allotment and pasture levels with negligible effects across the planning area. However, management for species such as sage-grouse, which utilize an extensive range of suitable habitat types within the sagebrush-steppe ecosystem, would likely result in restrictions that affect forage availability and use of infrastructure associated with livestock grazing across much of the planning area.

Impacts from Management Specific to the No Action Alternative

Forage availability would be affected by management actions that adjust or restrict use levels, season-of-use, or other management techniques to maintain or enhance special status species and their habitat. Considering Endangered, Threatened, or Sensitive plants in areas with known populations of these species would affect forage and areas available for livestock grazing in order to protect or enhance special status species habitat. Vegetation treatments to improve special status species habitat would increase these restrictions in order to protect habitat. The intensity and extent of the effects would be specific to the species and objective being managed for. Most effects would be limited to the pasture or

allotment level. However, actions such as limiting spring use and requiring a minimum residual herbaceous cover in sage-grouse nesting habitat would affect broader areas resulting in moderate to major effects to livestock grazing by limiting access to forage and limiting management practices such as trailing in those areas. Conversion from cattle to sheep in allotments containing bighorn sheep habitat would not be allowed unless a satisfactory separation is be agreed upon through consultation and coordination with the Idaho Department of Fish and Game. Effects of this action would be allotment specific and would have limited affect at the planning level.

Re-introduction of special status plants into historically occupied habitat would be allowed. Effects to livestock grazing resulting from re-introductions would likely reduce allocation and place more restrictions on seasons-of-use and infrastructure. The intensity and spatial extent of impacts would be dependent upon species. The site-specific impacts of these actions would be analyzed at the project-level.

The following actions would increase restrictions on infrastructure, affecting the ability of permittees to properly distribute livestock grazing:

- Maintaining a separation of use between cattle and bighorn sheep by not developing livestock water sources within one mile of bighorn sheep habitat unless adverse impacts can be mitigated. This action would be spatially limited to allotments and pasture with bighorn sheep habitat along the canyons associated with the Bruneau and Jarbidge rivers.
- Foregoing or redesigning an action if it is predicted to have an adverse effect on Endangered, Threatened, or Sensitive plants.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives would include following special status species conservation plans, Endangered Species Act Section 7 Consultation, and other conservation agreements and strategies. Through monitoring, adaptive management strategies would be used to reduce impacts to special status species and their habitat. Applying management actions such as season-of-use, utilization, and placement of infrastructure would be allotment specific. Intensity of changes to livestock grazing would be dependent upon species present, habitat conditions, and the relationship to livestock grazing. Conservation measures for special status species would reduce forage availability and limit the use and location of infrastructure. The effects would primarily be limited to the allotment level, but effects of management for species such as sage-grouse would be at the planning area level.

Livestock grazing in the planning area would be adjusted in areas identified as needing improvement in habitat condition ratings or Proper Functioning Condition ratings. Effects of these actions on livestock grazing would be adjustments to seasons-of-use, annual use criteria, and restrictions on placement of supplements and infrastructure in areas that would influence maintenance or improvement of riparian or aquatic habitats. Effects would primarily be spatially limited to the pasture and allotment level. Adjustments to livestock grazing to comply with Aquatic and Riparian Management Strategy would be limited to areas where upland forage was made unavailable because access to water was restricted or eliminated without provision of an alternate source.

Species-specific direction would likely limit location and/or timing of project construction, and maintenance of livestock management infrastructure that would reduce access to forage in portions of allotments. Impacts from these actions would be localized (allotment/pasture) and are anticipated to be negligible at the planning level.

Impacts from Management Specific to Alternative I

Forage availability would be affected by adjustments or use levels restrictions, seasons-of-use, or other management actions to maintain or enhance special status species and their habitat. Vegetation treatments to improve special status species habitat would likely result in increased restrictions as habitat suitability improves and these areas become occupied. The intensity and extent of the effects would be specific to the species and objectives being managed for. Most effects would be limited to the pasture or allotment level. However, actions such as limiting spring use and requiring a minimum residual herbaceous cover in sage-grouse nesting habitat would affect broader areas resulting in moderate to

major effects to livestock grazing by limiting access to forage and management practices such as trailing in those areas.

Re-introduction of special status plants into historically occupied habitat would be allowed. Effects to livestock grazing resulting from re-introductions would likely reduce allocation and place more restrictions on seasons-of-use and placement of infrastructure. The intensity and spatial extent of impacts would be dependent upon species. The site-specific impacts of these actions would be analyzed at the project-level.

To minimize the risk of transmission of disease from domestic to bighorn sheep Alternative I would not allow conversion kind of livestock from cattle to sheep or goats, or trailing of sheep or goats within nine miles of bighorn sheep habitat. This restriction would not decrease forage availability but would limit the opportunity for sheep and goat grazing in these areas and potentially increase operational cost to the permittee by requiring hauling or using alternative trailing routes.

The following actions would increase restrictions on infrastructure, affecting the ability of permittees to distribute livestock grazing and potentially decreasing access to available forage:

- Constructing, maintaining, modifying, or removing range infrastructure and other facilities as necessary to maintain or enhance special status species and their habitat.
- Removing existing troughs within one mile of the Bruneau and Jarbidge Canyon rims within bighorn sheep habitat, and relocating troughs more than one mile from the Bruneau and Jarbidge Canyon rims if the watering site is needed for livestock grazing.
- Removing existing fences and corrals within one mile of the Bruneau and Jarbidge Canyon rims within bighorn sheep habitat, except fences for pasture and allotment boundaries or for other resource protection.
- Locating new troughs, reservoirs, permanent fences, and corrals at least one mile from the Bruneau and Jarbidge Canyon rims within bighorn sheep habitat.

Impacts from Management Specific to Alternative II

Forage availability would be affected by management actions that adjust or restrict use levels, seasons-of-use, or other management techniques to maintain or enhance special status species and their habitat. Vegetation treatments to improve special status species habitat would likely increase these restrictions in order to protect habitat, but would be limited to existing native plant communities and would affect fewer areas than the other alternatives. The intensity and extent of the effects would be specific to the species and objective being managed for. Most affects would be limited to the pasture or allotment level. However, actions such as limiting spring use in sage-grouse nesting habitat would affect broader areas resulting in moderate to major effects to livestock grazing by limiting access to forage and management practices such as trailing in native plant communities.

Actions to minimize the risk of transmission of disease from domestic to bighorn sheep would follow BLM policy and would be less restrictive than all other alternatives.

Re-introduction of special status species would be allowed under this alternative but limited to species listed as Proposed, Candidates or listed under the Endangered Species Act. Effects to livestock grazing would be similar to those described in Alternative I.

Existing troughs, reservoirs, fences, and corrals would remain in bighorn sheep habitat. New troughs, reservoirs, permanent fences, and corrals would be allowed in bighorn sheep habitat if they do not conflict with meeting bighorn sheep habitat or life history requirements. These actions would result in fewer restrictions on infrastructure that decrease the permittees ability to distribute grazing or limit access to available forage than the other alternatives. The following action would increase restrictions on infrastructure:

- Constructing, maintaining, modifying, or removing range infrastructure and other facilities as necessary to maintain or enhance special status species and their habitat.

Impacts from Management Specific to Alternative III

The impacts to livestock grazing from management for special status species in Alternative III are the same as described for Alternative II.

Impacts from Management Specific to Alternative IV

Forage availability would be affected by actions such as cover requirements and season-of-use restrictions during nesting and early brood rearing periods more than all other alternatives, except Alternative V. Vegetation treatments to improve special status species habitat would be emphasized more than all other alternatives, decreasing available forage and areas available for grazing. The intensity and extent of the effects would be specific to the species and objective being managed for. Most effects would be limited to the pasture or allotment level. However, actions such as limiting spring use in sage-grouse nesting habitat would apply to non-native understory and native plant communities, expanding the area these restrictions would apply relative to all alternatives except Alternative V; resulting in moderate to major adverse effects to livestock grazing.

Re-introduction of special status plants into historically occupied habitat would be allowed. Effects to livestock grazing resulting from re-introductions would likely reduce allocation and place more restrictions on seasons-of-use and placement of infrastructure. The intensity and spatial extent of impacts would be dependent upon species. The site-specific impacts of these actions would be analyzed at the project level.

Actions to minimize the risk of transmission of disease from domestic to bighorn sheep would be the same as described for Alternative I.

The following actions would increase restrictions on infrastructure and management that would affect the ability of the permittee to distribute livestock grazing or decrease access to available forage:

- Constructing, maintaining, modifying, or removing range infrastructure and other facilities as necessary to maintain or enhance special status species and their habitat.
- Removing existing troughs within one mile of the Bruneau and Jarbidge Canyon rims within bighorn sheep habitat and relocating troughs more than one mile from the Bruneau and Jarbidge Canyon rims if the watering site is needed for livestock grazing.
- Removing existing fences and corrals within one mile of bighorn sheep habitat except fences for pasture and allotment boundaries or for other resource protection.
- Locating new troughs, reservoirs, permanent fences, and corrals at least one mile from bighorn sheep habitat.
- Allowing fences identified to protect resources and designing them to meet the needs of bighorn sheep.

Impacts from Management Specific to Alternative V

Forage availability would be decreased by actions such as higher cover requirements and season-of-use restrictions during nesting and early brood rearing periods more than all other alternatives. Vegetation treatments to improve special status species habitat would be emphasized more than all other alternatives, decreasing available forage and areas available for grazing. The intensity and extent of the effects would be specific to the species and objective being managed for. Most effects would be limited to the pasture or allotment level. However, actions such as limiting spring use in sage-grouse nesting habitat would apply to non-native understory and native plant communities, expanding the area these restrictions would apply to relative to all other alternatives.

Re-introduction of special status plant species into historically occupied habitat would be allowed. Effects to livestock grazing resulting from re-introductions would be similar those described for Alternative I.

Actions to minimize the risk of transmission of disease from domestic to bighorn sheep would be the same as described for Alternatives I and IV.

Management actions that increase restrictions on infrastructure and management would be the same as described for Alternative IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Forage availability would be decreased by management actions that adjust or restrict use levels, seasons-of-use, or other management techniques to maintain or enhance special status species and their habitat. Vegetation treatments to improve special status species habitat would likely increase these restrictions. The intensity and extent of the effects would be specific to the species and objective being managed for. Most effects would be limited to the pasture or allotment level. Actions specific to meeting sage-grouse habitat requirements are more restrictive than all other alternatives resulting in moderate to major effects to livestock grazing across a larger portion of the planning area.

Re-introduction of special status plant species into historically occupied habitat would be allowed. Effects to livestock grazing from re-introductions would likely reduce allocation and place more restrictions on seasons-of-use and placement of infrastructure. The intensity and spatial extent of impacts would be dependent upon species. The site-specific impacts of these actions would be analyzed at the project level.

Actions to minimize the risk of transmission of disease from domestic to bighorn sheep would be the same as described for Alternatives I, IV, and V.

The following actions would increase restrictions on infrastructure that would decrease the permittees ability to distribute livestock grazing or potentially limit access to available forage:

- Constructing, maintaining, modifying, or removing range infrastructure and other facilities as necessary to maintain or enhance special status species and their habitat.
- Water development and facilities would be maintained in a manner to minimize production of mosquitos which carry West Nile virus.
- Locating new troughs, reservoirs, permanent fences, and corrals at least one mile from the Bruneau and Jarbidge Canyon rims within bighorn sheep habitat.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

Wildland fire ecology and management includes elements of fire suppression capabilities, fuels management, and emergency stabilization and burned area rehabilitation (ES&BAR). These actions would affect the availability of forage through short- and long-term changes to vegetation and the relative composition of vegetation sub-groups within Vegetation Management Areas (see the *Upland Vegetation* section). ES&BAR and fuels management actions would affect areas available to livestock grazing during rehabilitation treatments (e.g., rest, seeding, and planting) following wildland fire and vegetation treatments to reduce fuels.

The identification of critical suppression areas would benefit livestock grazing by prioritizing resources for improved suppression efforts. Effective suppression would protect existing plant communities for long-term sustainability of perennial plant communities. Loss of perennial plants decreases production and the long-term availability of forage and provides opportunity for the introduction of noxious weeds and invasive plants. Table 4-330 describes how many acres available to livestock grazing would be within critical suppression areas.

Table 4-330. Critical Suppression Areas in Areas Available for Livestock Grazing by Alternative (Acres)

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Critical Suppression Areas	0	437,000	151,000	438,000	470,000	461,000	797,000	566,000

The effectiveness of fuels treatments, ES&BAR, and other vegetation treatment actions in influencing wildland fire return interval, and severity, would influence forage availability.

ES&BAR treatments would create short-term decreases in forage availability during temporary closures of burned areas but would return burned areas to productive livestock forage and restore animal unit months. If the current trend of large and recurring wildland fire continues, interruptions of grazing would be expected to continue. The use of temporary fences to protect burned areas but still allow grazing to continue in unburned portions of pastures would be allowed under certain limitations.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the entire planning area would be managed for full suppression with no prioritization for wildland fire suppression efforts. Lack of prioritization reduces the potential for critical resource needs to be identified and acted on in the event of multiple fire starts.

The No Action Alternative does not include management regarding temporary fences for ES&BAR activities or the amount of rest an area would need following wildland fire, providing the broadest range of flexibility of all alternative for use of temporary fences to protect recently burned areas but still allowing grazing to occur in unburned areas. These decisions would be made in accordance with BLM policy. Current policy allows for the construction of temporary fences, which would allow livestock grazing on unburned forage in a pasture. Current policy mandates rest of burned areas until ES&BAR objectives are met, reducing the amount of forage available for livestock grazing during that time. The duration of the impact would depend on the ES&BAR objective and the success of the treatment.

The No Action Alternative contains the least management of all the alternatives that would reduce wildland fire size and the number of human-caused fires (see the *Wildland Fire Ecology and Management* section). The trend toward larger wildland fires would continue resulting in increased short-term decreases of forage availability through the loss of vegetation due to wildland fire and rest following fire than any other alternative. Shorter wildland fire return intervals have more potential to result in changes from perennial to non-native annuals or other invasive plants resulting in long-term decreases of forage available to livestock.

Impacts from Management Common to All Action Alternatives

Burned areas would be rested from livestock grazing until ES&BAR objectives are met and predicted to be sustainable or until the treatment is determined to be unsuccessful. The impact of this action on forage availability would be the same as in the No Action Alternative.

Impacts from Management Specific to Alternative I

In Alternative I, 437,000 acres available to grazing would be in critical suppression areas.

Temporary fences would be allowed to protect burned areas and allow livestock grazing in areas where at least 2,000 unburned acres remain in a pasture. This would have varying impacts to forage availability as some pastures would have portions open to livestock grazing while others would not.

The use of native and non-native species in upland vegetation and ES&BAR treatments would allow selection of seed mixes that would offer the highest potential for successful establishment given site potential and competition with invasive species. Successful establishment of perennial species would

maintain forage availability in burned areas by providing more flexibility for selection of seed mixes that would result in higher success rates than Alternatives IV and V which may be difficult to obtain or may not be as successful in establishing on sites with high competition with invasive species, which would focus on use of native species only.

This alternative would be third in reducing wildland fire size, reducing the number of human-caused fires, and improving Fire Regime Condition Class (FRCC) (see the *Wildland Fire Ecology and Management* section) resulting in a moderate short- and long-term stabilization of forage availability.

Impacts from Management Specific to Alternative II

In Alternative II, 151,000 acres available to grazing would be in critical suppression areas. Temporary fences would be allowed to protect burned areas and allow for commercial uses. This would help maintain the amount of forage available to livestock grazing by allowing unburned portions of pastures to be grazed.

Wildland fire ecology and management actions would focus on strategic short-term management of fuels and conversion of annuals to perennial grassland that would result in maintaining forage availability more than all other alternatives.

This alternative would be fourth along with Alternatives III and V in reducing wildland fire size and the number of human-caused fires. Alternative II would decrease wildland fire size, the number of human-caused fires over the short term through suppression and grazing actions, but, fire size would continue an upward trend over the long term (see the *Wildland Fire Ecology and Management* section) increases risks of conversions from perennial to non-native annuals or other invasive plants that result in long-term decreases of forage available to livestock.

Impacts from Management Specific to Alternative III

In Alternative III, 438,000 acres available to grazing would be in critical suppression areas.

Temporary fences would be used to protect burned areas, with similar impacts to those discussed for Alternative II.

Alternative III would decrease wildland fire size over the short term through suppression and grazing actions. However, the number of human-caused fires would increase due to impacts from increased recreation and land use actions. Over the long term, wildland fire size would continue an upward trend.

Wildland fire ecology and management actions would be similar to Alternative II, using strategic fuels management and increased forage allocation to reduce wildland fire size across the planning area. The use of native and non-native species in ES&BAR actions would allow selection of seed mixes that would allow the highest potential for successful establishment given site potential and competition with invasive species. Successful establishment of perennial species would restore forage and assist suppression efforts (e.g., strategic placement of wildland fire-resistant species) similar to Alternative II, but more than Alternatives IV and V which emphasize use of native species which may be difficult to obtain or may not be as successful in establishing on sites with high competition with invasive species. Improving effectiveness of suppression efforts to limit wildland fire size would maintain forage available to livestock grazing in the short term, but fire size is expected to increase in the long term so these benefits would be moderated in the long term.

This alternative would rank fourth, along with Alternatives II and V, in reducing wildland fire size, the number of human-caused fires, and improving FRCC. The effects on forage availability would be similar to those described for Alternative II.

Impacts from Management Specific to Alternative IV

In Alternatives IV-A and IV-B, 470,000 and 461,000 acres available to grazing would be in critical suppression areas, respectively.

The impacts from the use of temporary fences in Alternative IV would be similar to those discussed for Alternative I; however, temporary fences would not be allowed in pastures with native plant communities. These pastures would be closed to grazing until ES&BAR objectives are met, decreasing forage availability during that time.

Alternative IV would decrease wildland fire size over the long term and reduction in rate of spread, but fire size would continue an upward trend in the short term. The number of human-caused fires would increase, but to a lesser degree than every alternative except for Alternative V.

Wildland fire ecology and management actions would use some short-term actions (i.e., create fuel breaks) but would focus more on using long-term actions (conversion from annual to native shrubland) to reduce fire size, intensity, and return intervals. ES&BAR actions would use more native species than the No Action Alternative and Alternatives I through III to move vegetation communities from perennial grassland to native shrubland. Conversion to native shrubland would increase restrictions on livestock management actions relative to the No Action Alternative and Alternatives I through III.

This alternative would rank second in reducing wildland fire size, with a slight increase in the number of human-caused fires. Alternative IV would result in moderate, beneficial long-term impacts to the number of fires and fire size resulting in smaller decreases in forage availability through the loss of vegetation due to fire and rest following fire than the No Action Alternative and Alternatives I, II, III, and V.

Impacts from Management Specific to Alternative V

In Alternative V, 797,000 acres available to grazing would be in critical suppression areas.

Temporary fences would not be allowed making unburned portions of pastures and allotments unavailable for grazing until ES&BAR objectives are met.

Alternative V would decrease wildland fire size over the short term due to suppression actions. The number of human-caused fires would increase, but at a lower rate than the other alternatives due to less recreation and land use authorizations, and more restrictive transportation and travel actions. Over the long term, FRCC would improve and fire size would be reduced due to vegetation treatments. This change would not be as effective as in Alternatives I or IV.

Wildland fire ecology and management actions would use more long-term actions (i.e. conversion from annual to native) with fewer short-term actions (i.e., fuel breaks) than all other alternatives to bring the planning area into FRCC 1. Upland vegetation and ES&BAR actions would use only native species and rely more on natural succession to move vegetation communities from perennial grassland to native shrubland. Reliance on natural succession to convert annual to native generally require longer periods of rest from livestock grazing, making forage in those areas unavailable. Conversion to native communities would increase restrictions on livestock management actions relative to all alternatives resulting in decreases of forage availability through decreased allocations and seasons-of-use restrictions.

This alternative would rank fourth, along with Alternatives II and III, in reducing wildland fire size, the number of human-caused fires, and improving FRCC. The effects on forage availability would be similar to those described for Alternatives II and III.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 566,000 acres available to grazing would be in critical suppression areas, more than all other alternatives except Alternative V.

Temporary fences would be allowed to protect burned areas while allowing livestock grazing of unburned areas within pastures. This would decrease the temporary loss of forage during ES&BAR treatments relative to Alternatives IV and V.

The use of native and non-native species in upland vegetation and ES&BAR treatments would maintain forage availability in burned areas more than Alternatives IV and V.

This alternative would be the most effective in reducing wildland fire size and reducing the number of human-caused fires. Alternative VI would result in moderate, long-term reductions to the number of fires and fire size, resulting in both short- and long-term stability of forage availability.

Impacts from Wild Horse Actions

The following indicators were used to analyze the impacts of Wild Horse actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

The Saylor Creek Herd Management Area (HMA) occupies approximately 7% of the planning area (see *Wild Horses*, Chapter 3) and allocation to wild horses would be less than 1% of available forage. However, impacts to forage available to livestock within the HMA would vary by alternative with allocation of forage to wild horses ranging from 0 to 172% relative to livestock within the HMA.

Conflicts between livestock grazing and wild horses can occur through competition for forage and water, damage to infrastructure, and social displacement of livestock from water and foraging areas by wild horses. The BLM participates in cost-sharing partnerships with livestock permittees in order to address maintenance and operation of water pipelines in the HMA. Decreases in livestock grazing and increases in wild horse numbers in the HMA would increase the BLM's responsibility for maintenance and operation of water systems. Periodic gathers to maintain horse numbers would be coordinated with grazing schedules to minimize conflicts between grazing and gather operations.

Table 4-331. Allocation of Forage (Animal Unit Months) for Livestock Grazing and Wild Horses in the Saylor Creek Herd Management Area by Alternative if Vegetation Objectives are Met by Alternative

Forage Allocation	Alternative						
	No Action	I	II	III	IV	V	VI
Allocation to Wild Horses	600	2,400	0	7,200	2,400	6,000	2,400
Allocation to livestock within the HMA (AUMs)	10,000 to 17,000	15,000 to 21,000	33,000 to 40,000	25,000 to 31,000	8,000 to 12,000	4,000 to 7,000	18,000 to 27,000

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would allocate 600 AUMs for an appropriate management level (AML) of 50 wild horses. Maintaining a breeding herd of 50 wild horses would have negligible effects on forage availability to livestock grazing within the HMA.

Some effort would be required to minimize conflicts between livestock grazing and wild horses; however, there would be fewer conflicts than Alternatives I, III, IV, V, and VI due to the small herd size. Conflicts would be localized spatially and associated with social displacement of cattle by horses at grazing and watering areas.

Impacts from Management Specific to Alternative I

Alternative I would allocate 2,400 AUMs for a breeding herd to be managed at an AML of 100 to 200 wild horses. A breeding herd of that size would reduce forage availability for livestock grazing within the HMA compared to Alternative II, but less than Alternatives III and IV, which have higher AMLs. The effects on forage availability would be localized and minor considering the total amount of forage available within the HMA.

A breeding herd of 100 to 200 horses would increase conflicts between livestock and wild horses relative to the No Action Alternative, similar to Alternatives IV and VI, but less than Alternatives III and V. The amount of time and expense to maintain water systems and fences would increase due to damage caused by the higher number of wild horses. Reconfiguration of fences would occur if necessary to facilitate genetic exchange, wild horse social interactions, or free-roaming characteristics. The effects of fence reconfiguration would have minor to moderate adverse impacts on livestock management and would be allotment specific. Closer coordination with permittees during gather operations would be required with larger wild horse herds as the periodic gather operations would be more complex.

Impacts from Management Specific to Alternative II

Under Alternative II, wild horses would be removed from the HMA. After meeting needs for watershed and wildlife, forage in the HMA would be available for livestock grazing.

Coordination with permittees would be necessary during the gather and permanent removal of horses, but impacts would be limited to one time during the period of the gather. The BLM's participation in cost sharing with livestock permittees for maintenance and operation expenses would no longer occur. Permittees would no longer incur maintenance and operating expenses from wild horses.

Impacts from Management Specific to Alternative III

Alternative III would allocate 7,200 AUMs for a breeding herd to be managed at an AML of 200 to 600 wild horses. Allocation of forage is the highest to wild horses, and second highest to livestock grazing, of all alternatives so is expected to result in the largest increase in competition between livestock and wild horses for forage and water. Heavy, year-round use of favored grazing, watering, and loafing areas by wild horses would negatively affect rangeland health and decrease the long-term sustainability of forage production. Distribution of wild horses into smaller herds between multiple allotments would help minimize some of these impacts.

More effort would be required to reduce conflicts between livestock grazing and wild horses than in any other alternative. Damage to water systems and other infrastructure would increase maintenance and operating expenses for both the permittee and the BLM. Removal or reconfiguration of fences would be expected to increase relative to all other alternatives to facilitate genetic exchange, wild horse social interactions, free-roaming characteristics, and maintaining rangeland health.

Impacts from Management Specific to Alternative IV

Alternative IV would allocate 2,400 AUMs for a non-breeding herd to be managed at an AML 100 to 200 wild horses. Effects on forage availability and infrastructure would be similar to those described for Alternatives I and VI, except impacts would be moderated relative to alternatives with higher forage allocations to livestock grazing. Because the wild horse herd would be non-breeding they could be distributed through the allotments within the HMA in smaller bands without negatively affecting genetic diversity. Rangeland health would be improved and forage production maintained.

Coordination with permittees would be necessary to reduce conflicts between livestock grazing and wild horses in the short term as breeding wild horses are gathered and removed. As the HMA is repopulated with non-breeding wild horse and numbers increased over time, stress on water systems would also increase conflicts with livestock grazing. Over the life of the plan, except deaths due to old age or injuries, wild horse numbers would be expected to remain relatively constant and near the upper AML.

The population of a non-breeding herd would be static relative to a breeding herd, with changes occurring due to death or introduction of wild horses from outside the HMA. Gathers would not be necessary for population management and generally would only be necessary in cases of herd health management or emergency, reducing related conflicts with permittees.

Impacts from Management Specific to Alternative V

Alternative V would allocate 6,000 AUMs for a non-breeding herd to be managed for an AML 200 to 500 wild horses, the second highest allocation of all alternatives. Heavy, year-round use of favored grazing, watering, and loafing areas by wild horses would decrease the long-term sustainability of forage

production. The allocation of forage to livestock grazing is the lowest of all alternatives and would be expected to have fewer impacts from livestock grazing which would moderate the effects to forage sustainability relative to Alternative III, which has a similar AML. An AML of this size would require more removal or relocation of allotment fences as well as actions to induce rotational use of the HMA by horses to maintain rangeland health.

Coordination with permittees would be necessary to reduce conflicts between livestock grazing and wild horses in the short term as breeding wild horses are gathered and removed. As the HMA is repopulated with non-breeding wild horses and numbers increased over time, stress on water systems and competition for forage would increase conflicts with livestock grazing. Relative to Alternatives I, IV, and VI, the herd size would be as much as two and a half times larger, so the magnitude of the effects would be expected to be proportionate, resulting in more effort by the permittees and the BLM to maintain watering system, fences, and Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. Gathers would be limited as described for Alternative IV, but would be necessary to maintain distribution of wild horses within HMA allotments that will maintain Rangeland Health.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would allocate 2,400 AUMs for an AML of 50 to 200 wild horses. A wild horse herd of this size reduces forage availability for livestock grazing within the HMA, with effects similar to those described for Alternatives I and IV, but less than Alternatives III and V.

A wild horse herd of this size would likely result in more conflicts between livestock and wild horses than the No Action Alternative and similar to Alternative I because allocations to livestock are similar. However, conflicts between wild horses and livestock would likely be more than Alternative IV because of the lower allocation of AUMs to livestock grazing in that alternative. Conflicts between livestock and wild horses in this alternative would less than alternatives III and V because of the lower AML. The amount of time and expense to maintain water systems and fences would increase due to damage caused by wild horses. Reconfiguration of fences would occur if necessary to facilitate genetic exchange, wild horse social interactions, free-roaming characteristics, or rangeland health. Fence reconfiguration would have a minor to moderate negative effect on livestock management but would be less than Alternatives III and V.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

Impacts from transportation and travel management on livestock grazing include reduction of forage availability through soil compaction or loss, vegetation damage, conversion to annual grasslands, and increased human-caused fire. Transportation and travel can also displace livestock from foraging areas. Permittee access to closed areas would be limited to non-mechanized means unless otherwise authorized, increasing the difficulty of maintaining infrastructure.

Transportation and travel is related to recreation in Special Recreation Management Areas (SRMAs) that accommodate recreational cross-country motorized vehicle use activities and settings. The impacts to livestock grazing are discussed in this section because that recreational activity is dependent on a travel designation of open to cross-country motorized vehicle use.

Table 4-332 describes travel designations as well as SRMAs with a motorized recreation emphasis for the planning area.

Table 4-332. Travel Designations in Areas Available for Livestock Grazing by Alternative (Acres)

Travel Designation	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Open to Cross-Country Motorized Vehicle Use	327,000	0	0	4,000	4,000	4,000	700	4,000
Limited to Designated Routes	953,000	1,212,000	1,275,000	1,271,000	1,152,000	1,183,000	957,000	1,269,000
Closed to Motorized Vehicle Use	41,000	86,000	41,000	41,000	77,000	77,000	113,000	41,000
SRMA with Motorized Recreation Emphasis [A]	0	32,000	0	34,000	34,000	34,000	3,000	16,000

[A] This SRMA is the Deadman/Yahoo, or Yahoo SRMA, depending on the alternative.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would designate 327,000 acres available for livestock grazing as open to cross-country motorized vehicle use, the most of any alternative. The No Action Alternative would have fewer acres (41,000) available for livestock grazing that are closed to motorized vehicle use than Alternatives I, IV, and V. The No Action Alternative would not allocate a SRMA for motorized recreation and does not include direction for limiting conflicts between livestock grazing and recreationalists. Due to increasing demand for cross-country motorized vehicle recreation, route density and use of the planning area is expected to increase. Increased route density would create more opportunity for introduction and spread of noxious weeds and invasive plants, decreasing forage availability and increasing the risk of wildland fire. The No Action Alternative would have the most adverse impacts to forage available to livestock grazing because it has the largest number of acres vulnerable to reduced forage availability from transportation and travel impacts of all the alternatives.

Impacts from Management Specific to Alternative I

Alternative I would designate 32,000 acres of SRMA for motorized recreation. While 27,000 acres of the SRMA would be limited to designated routes and would remain available to grazing, 4,000 acres of the SRMA would be open to cross-country travel and closed to livestock grazing to minimize conflict between user groups. Decreases of forage availability would be negligible at the planning level but would be minor to moderate in allotments where those closures occur. Livestock displacement would occur in areas of the SRMA remaining available to livestock grazing, but direction in management actions would reduce conflicts. This would require increased effort by permittees to resolve these conflicts in the short term, but reduce the amount of effort needed in the long term.

Alternative I would designate 86,000 acres available for livestock grazing as closed to motorized vehicle use, more acres than all other alternatives. These areas are within Bruneau-Jarbidge Rivers Wilderness Area and areas containing Lands with Wilderness Characteristics. Because motorized use would not be allowed except by specific authorization, the effort needed by permittees to maintain infrastructure, and relocate and inspective livestock manage livestock grazing in the areas closed to motorized travel would increase. Site-specific exceptions to motorized vehicle restrictions could be authorized, reducing impacts of restrictions to permittees managing their allotments.

Impacts from Management Specific to Alternative II

Alternative II does not allocate a SRMA for motorized recreation but provides direction for reducing conflicts between motorized recreation activities and livestock grazing operations in areas of designated

routes. This would require increased the effort required by permittees to resolve conflicts in the short term, but reduce the effort needed in the long term.

Alternative II would not designate any areas available for livestock grazing as open to cross-country motorized vehicle use. This would reduce the number of acres vulnerable to transportation and travel impacts. Areas closed to cross-country travel would be limited to areas within the Bruneau-Jarbidge Rivers Wilderness Area (41,000 acres), limiting motorized access for maintain infrastructure. Impacts associated with these restrictions would be similar to the No Action Alternative and Alternatives III and IV. Specific exceptions or permits for historical uses would be addressed in the wilderness management plan.

Impacts from Management Specific to Alternative III

Alternative III would designate 34,000 acres of SRMA for motorized recreation; these acres would remain available to grazing. Impacts would be similar to those described for Alternative I, except all acres would remain available to livestock grazing.

Approximately 4,000 acres of the planning area would be open to cross-country travel that would remain available for livestock grazing and would all be within the Deadman/Yahoo SRMA; 41,000 acres within the Bruneau-Jarbidge Rivers Wilderness Area would be closed to motorized vehicle travel. Alternative III would close fewer acres to motorized vehicle than alternatives IV and V. The number of acres closed would be the same as the No Action Alternative and Alternative II and have the same site-specific exceptions, resulting in the same impacts. The remainder of the planning area would be limited to designated routes. Open areas would have the highest potential for reducing forage availability and increasing conflict with livestock grazing. Impacts would be minor to moderate in allotments where the open areas occur but would be negligible at the planning level.

Impacts from Management Specific to Alternative IV

Alternative IV would designate 34,000 acres of SRMA for motorized recreation; all acres would remain available to grazing. Impacts would be similar to those described for Alternative I, except all acres would remain available to livestock grazing.

Approximately 4,000 acres of the planning area within the Deadman/Yahoo SRMA would be open to cross-country travel and available for livestock grazing; the remainder would be limited to designated routes. Open areas would have the highest potential for reducing forage availability and increasing conflict with livestock grazing. Impacts would be minor to moderate in allotments where the open areas occur but would be negligible at the planning level.

Alternative IV would designate 77,000 acres as closed to motorized vehicle use, more acres than in any alternative except Alternatives I and V. Areas closed to motorized travel would occur within the Bruneau-Jarbidge Rivers Wilderness Area and areas containing Lands with Wilderness Characteristics. Further restrictions on travel during fire restrictions would reduce risk of human-caused fires. Because motorized use would not be allowed except by specific authorization, the effort needed by permittees to maintain infrastructure, and relocate and inspective livestock manage livestock grazing in those areas would increase. Site-specific exceptions to motorized vehicle restrictions could be authorized, mitigating impacts of restrictions to permittees managing their allotments.

Impacts from Management Specific to Alternative V

Alternative V would designate 3,000 acres of SRMA for motorized recreation; all acres would remain available to grazing. Livestock displacement would likely occur due to increased human activity on those acres, but management actions would reduce conflicts between motorized recreation activities and livestock grazing operations. This would require increased effort in the short term, but reduce the amount of effort needed to reduce conflicts in the long term. Fewer acres of SRMA and the lower livestock allocation of this alternative would result in less conflict between motorized recreation and livestock grazing than Alternatives I, III, IV, and VI.

Approximately 700 acres of the planning area would be open to cross-country travel; the remainder would be limited to designated routes. These areas would all be within the Yahoo SRMA. Open areas would remain available for livestock grazing and have the highest potential for reducing forage availability and increasing conflict with livestock grazing. Impacts would be minor in allotments where the open areas occur and negligible at the planning level. Livestock displacement would likely occur due to increased human activity on those acres; however, the impacts would be smaller than in Alternatives III and IV, due to the decreased acreage.

Alternative V would close the most acres available for livestock grazing to motorized vehicle use of all alternatives. While closing these areas to motorized vehicle use would reduce the potential for impacts to forage availability from motorized travel, limiting access to non-motorized methods would increase the amount of effort needed by permittees to reduce livestock grazing conflicts with resources or uses. Site-specific exceptions to motorized vehicle restrictions would not be made.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate 16,000 acres of SRMA for motorized recreation; these acres would remain available to grazing. Livestock displacement would likely occur due to increased human activity on those acres, but management actions provide direction that would reduce conflicts between motorized recreation activities and livestock grazing operations. This would require increased effort in the short term, but reduce the amount of effort needed to reduce conflicts in the long term. Fewer acres of SRMA would result in less conflict between motorized recreation and livestock grazing than Alternatives I, III, and IV, which have higher allocations for this use.

Alternative VI would designate the same number of acres open to cross-country motorized vehicle use as Alternatives III and IV, resulting in similar impacts.

Alternative VI would designate 41,000 acres as closed to motorized vehicle use, the same as the No Action Alternative, and Alternatives II and III, but less than Alternatives I, IV, and V. Further restrictions on travel applied during fire restrictions would likely reduce risk of human-caused fires. Site-specific exceptions to motorized vehicle restrictions could be authorized, mitigating impacts of restrictions to permittees managing their allotments.

Impacts from Land Use Authorizations Actions

The following indicators were used to analyze the impacts of Land Use Authorizations actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

The construction of transportation routes and associated infrastructure for land use authorizations would affect the availability of forage by removing or converting vegetation types. The potential decrease in forage from land use authorizations would not change forage availability at the planning level but would likely result in a lower allocation of forage at the allotment level.

Human activity associated with construction and maintenance of infrastructure can displace livestock and result in more concentrated grazing in unaffected areas of the allotment. Livestock would be temporarily displaced from the immediate vicinity of construction due to increased human activity but would quickly become acclimated to the new infrastructure and resume utilization of the area. Long-term effects to forage availability would be the permanent removal and altering of vegetation during construction and maintenance of new roads and infrastructure (e.g., communication towers, wind turbines, substations).

While projects may be proposed anywhere in the planning area other than exclusion areas, projects are likely to occur within utility right-of-way (ROW) corridors allocated for those uses in Chapter 2, and, in the case of wind energy, in areas with expected wind energy development. Expected wind development areas are more likely to contain a higher concentration of structures than expected utility development areas. This would result in more impacts to forage availability, more effort needed to reduce conflicts with

livestock grazing and vegetation, and measures to mitigate effects of the project on special status species.

Table 4-333. Utility Right-of-Way Corridors and Expected Wind Development Areas in Areas Available for Grazing by Alternative (Acres)

Land Use Authorization	Alternative						
	No Action	I	II	III	IV	V	VI
Utility ROW Corridors	27,000	48,000	50,000	50,000	50,000	35,000	40,000
Expected Wind Energy Development Areas	107,000	32,000	123,000	47,000	33,000	23,000	21,000

Impacts from authorized land use activities constructed in special status species habitat would likely have a greater effect on livestock grazing than activities habitats not containing special status species. Projects that decrease the amount or quality of special status species habitat would likely require mitigation in allotments within the project area as well as adjoining allotments containing habitat for the affected species. These actions would likely decrease forage available to livestock during treatments and through additional restrictions on allocation, season-of-use, grazing use criteria, and placement and management of infrastructure. The intensity and size of mitigating measures would be dependent upon the impacts of the project. Acres of key sage-grouse habitat within areas available to livestock grazing were used as an indicator of potential effects to livestock grazing due to mitigation for habitat loss due to land use authorizations.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would have 27,000 acres available for livestock grazing in expected utility development areas and 107,000 acres in expected wind energy development areas. Along with Alternative II, this is the most acres allocated to these authorizations in areas available for livestock grazing, resulting in the second largest potential for impacts to forage availability and effort needed to reduce conflicts.

The No Action Alternative has the second most acres (49,000) of key sage-grouse habitat in expected wind energy development areas so would be expected to have the second highest likelihood that these projects would require mitigation affecting forage availability and effort needed to reduce conflicts.

Impacts from Management Specific to Alternative I

Alternative I would have 48,000 acres available for livestock grazing in expected utility development areas and 32,000 acres in expected wind energy development areas. With the exception of Alternatives V and VI, this is the fewest number of acres allocated to these authorizations in areas available for livestock grazing, resulting in the third lowest potential for impacts to forage availability and effort needed to reduce conflicts.

Alternative I has the fourth highest number of acres (3,400) of key sage-grouse habitat in expected wind energy development areas (see *Impacts from Land Use Authorizations Actions, Special Status Species*). This would result in more risk than Alternatives IV, V, and VI that these projects would result in mitigation affecting forage availability, but less risk than in the No Action Alternative and Alternatives II and III.

Impacts from Management Specific to Alternative II

Alternative II would result in 50,000 acres available for livestock grazing in expected utility development areas and 123,000 acres in expected wind energy development areas. This is the highest amount of acres allocated to these authorizations in areas available for livestock grazing, resulting in the largest potential for impacts to forage availability.

Alternative II would have the most acres (58,000) of key sage-grouse habitat in expected wind energy development areas (see *Impacts from Land Use Authorizations Actions, Special Status Species*). It would have the highest risk that these projects would result in mitigation affecting forage availability.

Impacts from Management Specific to Alternative III

Alternative III would result in 50,000 acres available for livestock grazing in expected utility development areas and 47,000 acres in expected wind energy development areas. This alternative would result in more potential for impacts to forage availability and effort needed to reduce conflicts than Alternatives I, IV, V, and VI, but less than the No Action Alternative and Alternative II.

Alternative III would have the third most acres (10,500) of key sage-grouse habitat in expected wind energy development areas (see *Impacts from Land Use Authorizations Actions, Special Status Species*). Acres of expected wind energy development in key sage-grouse habitat are 18% and 21% of what would be in the No Action Alternative and Alternative II, respectively. There would be a lower risk that these projects would result in mitigation affecting forage availability.

Impacts from Management Specific to Alternative IV

Alternative IV would result in 50,000 acres available for livestock grazing in expected utility development areas and 33,000 acres as expected wind energy development areas. This alternative would result in more potential for impacts to forage availability and effort needed to reduce conflicts than Alternatives I, V, and VI, but less potential than the No Action Alternative and Alternatives II and III.

Alternative IV would have the fifth most acres (184) of key sage-grouse habitat in expected wind energy development areas. Alternative IV would have less than 1% of the acres of key sage-grouse habitat in areas of expected wind energy development than the No Action Alternative and Alternative II. There would be a low risk that these projects would result in mitigation affecting forage availability.

Impacts from Management Specific to Alternative V

Alternative V would result in 35,000 acres available for livestock grazing in expected utility development areas and 23,000 acres as expected wind energy development areas. This is the fewest amount of acres allocated to these authorizations in areas available for livestock grazing, resulting in the least potential for impacts to forage availability and effort needed to reduce conflicts.

Alternative V contains no acres of key sage-grouse habitat in expected wind energy development areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would result in 40,000 acres available for livestock grazing in expected utility development areas and 21,000 acres as expected wind energy development areas. This is the next fewest amount of acres allocated to these authorizations in areas available for livestock grazing except for Alternative V. It results in the second lowest potential for impacts to forage availability.

Alternative VI contains no acres of key sage-grouse habitat in expected wind energy development areas so would have the lowest risk of all alternatives for mitigation associated with these projects to affect forage availability.

Impacts from Leasable Mineral Actions

The following indicators were used to analyze the impacts of Leasable Mineral actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

Surface occupancy for leasable mineral exploration and extraction would affect livestock grazing, altering forage availability by changing the acres available to grazing and increasing human activity. Forage would be directly removed through alteration of the vegetation or indirectly removed as livestock avoid areas with increased human activities or new structures. Increasing human activity would also increase the opportunity for human-caused fires and the introduction of noxious weeds and invasive plants.

Oil and gas exploration activity is expected to be relatively short, over several weeks or months, but intense, requiring 10 to 15 people and 5 to 7 vehicles (Appendix K). Seismic reflection using explosives is

the preferred method for exploration and would pose the most disturbance to livestock in the immediate area. Displacement of livestock from the immediate area of exploration activity would occur, but is expected to be short-term with cattle returning to the area soon after testing is concluded.

Development is anticipated to be limited to two wells (approximately ten acres) during exploration, with one well producing oil. Five additional wells would be drilled at the producing well, increasing surface occupancy to 30 acres. Increased route density in the vicinity of the six wells (approximately 10 acres per well) would improve access and increase human activity and ground disturbance. This increases the potential for introduction and spread of noxious weeds and invasive plants, reducing the stability of the forage base. Increased human activity would temporarily displace livestock from the immediate vicinity of construction; however, livestock would quickly become acclimated to the new permanent infrastructure and resume use of the area. Construction and maintenance of new roads and infrastructure (e.g., pump stations, pipelines) would permanently remove and alter vegetation, affecting long-term forage availability.

A typical oil or gas well utilizes 5,000 to 15,000 gallons of water per day, requiring acquisition of water rights. Depending upon the location of and number of oil and supporting water wells, there is potential to affect the water table and production of existing wells and springs supplying water to livestock watering systems. This would result in increased effort in order to adequately water livestock.

For geothermal development, increased human activity would increase disturbance to livestock, but effects would be short-term and associated with project implementation and construction. In contrast to oil and gas exploration, seismic surveys are not widely used in geothermal exploration. Instead, less-disturbing geophysical and geochemical surveying methods would be used for initial exploration, which would typically require two to four people walking or moving through a large area for several days (Appendix L). Exploration would also likely include drilling 20 temperature gradient wells over the life of the plan, creating approximately 85 acres of surface disturbance. Those localized areas would have increased potential for introduction and spread of noxious weeds and invasive plants. Disruption to livestock would be negligible as drilling would be completed within a few weeks.

Development is anticipated to be limited to five production wells and five injection wells (approximately 35 acres), with approximately two acres of new roads being constructed for each well. In addition, a power plant (10 acres), pipelines (30 acres), and transmission lines (50 acres) would be constructed for commercial operations; however, no additional access roads are expected to be necessary for these. A typical geothermal production well produces one million to six million gallons of geothermal fluids per day, requiring acquisition of water rights; these fluids are returned to the geothermal reservoir through the injection wells. Impacts from these geothermal development structures and activities on livestock grazing would be similar to the impacts described above for oil and gas development.

On- and off-site mitigation for the impacts of leasable mineral development on special status species habitat would likely affect forage availability. Increased emphasis would be placed on restoration of marginal habitat to replace lost or diminished habitat within the project area. These actions would decrease forage available to livestock during restoration treatments and through additional long-term restrictions on allocation, season of use, and placement and management of infrastructure. The intensity and extent of mitigating measures (e.g., acres available to livestock, adjustment to allocation and utilization limits) would be dependent upon the project, but are expected to be minor to moderate due to the limited potential for discovery and the relatively small impact of the development footprint (90 acres for oil and gas, 185 to 230 acres for geothermal).

Areas open to leasable mineral development with no surface occupancy restrictions are not expected to impact livestock grazing because there would be no change to forage availability or increase in human activity.

Table 4-334 identifies the number of acres open or closed to mineral leasing in areas with potential for oil and gas development and areas with medium to high potential for geothermal development.

Table 4-334. Leasable Mineral Allocation in Areas Available for Livestock Grazing with Leasable Mineral Potential by Alternative (Acres)

Leasable Mineral Allocation	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Oil and Gas								
Open [A]	317,000	274,000	290,000	286,000	255,000	255,000	190,000	286,000
Closed	22,000	6,000	0	3,000	32,000	32,000	7,000	3,000
Total	**380,000**	**280,000**	**290,000**	**289,000**	**287,000**	**287,000**	**197,000**	**289,000**
Geothermal [B]								
Open [A]	387,000	331,000	349,000	346,000	341,000	341,000	301,000	345,000
Closed	124,000	2,000	0	3,000	5,000	5,000	0	3,000
Total	**535,000**	**333,000**	**349,000**	**349,000**	**346,000**	**346,000**	**301,000**	**329,000**

[A] Includes acres open, open with seasonal restrictions, and open with controlled surface use restrictions.
[B] Includes areas with medium to high potential for geothermal resources.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative contains the most acres available for livestock grazing, 317,000, with potential for oil and gas development. While this acreage on which oil or gas could be discovered development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas that would be available for leasing.

The No Action Alternative contains the most acres available for livestock grazing with medium to high potential for geothermal development. Of these acres, 387,000 acres are open to geothermal development. While this acreage is larger than in the action alternatives, increasing the number of acres on which a geothermal resource could be discovered, development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas that would be available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Management Specific to Alternative I

Alternative I contains the fourth most acres available for livestock grazing with potential for oil and gas development. In areas available for livestock grazing, 274,000 acres would be available for oil and gas development, less than Alternatives II, III, and VI but more than Alternatives IV and V. Development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas available for leasing.

Alternative I contains the sixth most acres available for livestock grazing with medium to high potential for geothermal development. Development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Management Specific to Alternative II

Alternative II contains the second most acres available for livestock grazing with potential for oil and gas development. In areas available for livestock grazing, 290,000 acres would be available for oil and gas development. However, development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas available for leasing.

Alternative II contains the second most acres available, 349,000, for livestock grazing with medium to high potential for geothermal development. Development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Management Specific to Alternative III

Alternative III contains the third highest number of acres available for livestock grazing with the potential for oil and gas development. In areas available to livestock grazing, 286,000 acres are open to oil and gas development, more than Alternatives I, IV, and V, but fewer than Alternative II. Development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas available for leasing.

Alternative III contains the third most acres available (346,000) for livestock grazing with medium to high potential for geothermal development; however, development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Management Specific to Alternative IV

Alternatives IV-A and IV-B contain the second fewest acres available for livestock grazing with potential for oil and gas development. In areas available for livestock grazing, 255,000 acres would be available for oil and gas development, fewer than the other alternatives with the exception of Alternative V. Development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas available for leasing.

Alternatives IV-A and IV-B contain the fifth most acres available for livestock grazing with medium to high potential for geothermal development. In areas available for livestock grazing, 341,000 acres would be available for geothermal development. Development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Management Specific to Alternative V

Alternative V contains the fewest acres available for livestock grazing with potential for oil and gas development. In areas available for livestock grazing, 190,000 acres would be available for oil and gas development, fewer than the other alternatives. Development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas available for leasing.

Alternative V contains the fewest acres available for livestock grazing with medium to high potential for geothermal development. In areas available for livestock grazing, 301,000 acres would be open to geothermal development. Development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI contains third most acres available for livestock grazing (286,000) with potential for oil and gas development. Development is only anticipated on 90 acres over the life of the plan, less than 0.1% of the potential oil and gas areas available for leasing.

Alternative VI contains fourth highest acres available for livestock grazing with medium to high potential for geothermal development. In areas available for livestock grazing, 326,000 acres would be available for geothermal development. Development is only anticipated on 185 to 230 acres over the life of the plan, less than 0.1% of the potential geothermal areas available for leasing.

The impacts to forage availability and use of infrastructure would be limited to localized areas and the effects would be expected to be minimal.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on livestock grazing:

- Availability of forage for livestock grazing and
- Restrictions on infrastructure for livestock grazing.

ACEC management can affect forage availability through acres available to grazing, season of use, stocking rates, and utilization. ACEC management can also place restrictions on the use and placement of infrastructure and salt and supplement placement. The size and location of the ACEC would affect the manageability of allotments in which the ACEC occurs or is adjacent to, requiring additional effort to minimize conflicts between livestock grazing and relevant and important values. All areas made unavailable to livestock grazing by ACEC designation were represented in *Impacts from Livestock Grazing Actions*.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, the Bruneau-Jarbidge ACEC would be available for grazing; however, livestock are prevented from accessing canyons through fencing and geographic features (canyon rims). Due to relevant and important wildlife values, restrictions would be made for locating infrastructure. Livestock grazing would be analyzed at the allotment level to determine compatibility with the ACEC designation.

Under the No Action Alternative, the Salmon Falls Creek ACEC is closed to livestock grazing. This ACEC is located entirely within rim to rim of the canyon and physically inaccessible to livestock. Closing the 3,000 acres to livestock grazing would have no effect on forage availability.

There are no management actions specific to the Sand Point ACEC that would affect livestock.

Impacts from Management Specific to Alternative I

Alternative I would designate 85,000 acres to the Bruneau-Jarbidge ACEC; 56,000 acres would be in areas available to livestock grazing increasing adverse impacts to livestock grazing relative to the No Action Alternative and Alternative III, but less than Alternative IV. Management for relevant and important values would likely result in adjustments to seasons-of-use in the Bruneau-Jarbidge ACEC to minimize conflicts with bighorn sheep and would limit forage availability. Salting and supplements would be prohibited in the ACEC.

The Lower Bruneau Canyon ACEC includes 1,000 acres, a small portion of one allotment. Under Alternative I, the Lower Bruneau Canyon ACEC would be available to livestock grazing. New infrastructure would be allowed with restrictions if it is compatible with recovery of the area. Designation of this ACEC would have negligible effects on forage or areas available for livestock grazing.

Of the 7,000 acres of the Middle Snake ACEC, 4,000 acres would be available to livestock grazing as a designated trailing corridor. Areas unavailable to livestock grazing generally have steeper slopes, severely erodible soils, and numerous areas with special status plants. Additional effort by permittees would be required during trailing to ensure livestock remained within the authorized trailing route and did not remain in the ACEC overnight. Restrictions in areas available for livestock grazing would have negligible effects on grazing, similar to Alternative V.

The impacts from the Salmon Falls Creek ACEC would be similar to those described for the No Action Alternative.

Management for relevant and important values would place restrictions on salt and supplements in the Sand Point ACEC (1,000 acres) but would have negligible impacts to livestock grazing due to the relatively small size and location of the ACEC.

Impacts from Management Specific to Alternative II

No ACECs would be designated in Alternative II. As a result, there would be no impacts to forage availability, restrictions on infrastructure or effort needed to reduce resource and use conflicts with livestock grazing due to ACEC management.

Impacts from Management Specific to Alternative III

Alternative III would designate a reduced sized Bruneau-Jarbidge ACEC (57,000 acres); 38,000 acres would remain available to livestock grazing. Salt and supplements would be prohibited in the Bruneau-Jarbidge ACEC; however, the ACEC would be smaller in Alternative III than in the No Action Alternative and Alternative IV. As a result, impacts from restriction in this ACEC would be less than Alternative III and VI.

The impacts from the Salmon Falls Creek ACEC would be similar to those described for the No Action Alternative. The impacts from the Sand Point ACEC would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative IV

Alternative IV would implement the highest number of acres in ACECs that would affect areas available to livestock grazing of all alternatives.

Under Alternative IV the Bruneau-Jarbidge ACEC would be 123,000 acres, approximately 92,000 acres in areas available to livestock grazing. Adjustments to season of use and stocking rates in the Bruneau-Jarbidge ACEC to minimize conflicts with bighorn sheep, bull trout, and Davis's peppergrass would likely limit forage available to livestock. Throughout the year, at least one pasture would be managed under restrictions to livestock grazing, except during July and again in late November. Range infrastructure would be allowed where it protects relevant and important values. The modification or removal of infrastructure would increase the amount of effort needed to reduce conflicts between livestock grazing and relevant and important values. Salting and supplements would not be allowed, further increasing the amount of effort needed to manage livestock grazing in the ACEC. Adverse impacts to livestock grazing from this ACEC would be more than Alternatives I and III.

Under Alternatives IV-A and IV-B, the Inside Desert ACEC would affect 73,000 acres and 41,000 acres, respectively. These acres would not be available to livestock grazing. Existing infrastructure would be removed from the ACEC. Removing infrastructure from this ACEC would affect management of adjoining pastures and allotments by interruption of water delivery. Decreasing continuity of pastures would affect the efficiency and effectiveness of managing allotments to meet resource objectives by requiring longer trailing routes or trucking of livestock around closed areas.

Alternatives IV-A and IV-B would designate 136,000 acres and 66,000 acres, respectively, in the Foothills ACEC. Livestock grazing would remain available on 131,000 acres and 61,000 acres, respectively. To meet relevant and important values adjustments would be made to season of use and stocking rates to minimize conflicts with special status species and restoration projects. Extended periods of rest and reduced stocking rates to facilitate habitat restoration and management would decrease available forage and areas available for grazing.

The impacts from the Lower Bruneau Canyon ACEC and the Sand Point ACEC would be similar to those described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, the 7,000 acres in the Middle Snake ACEC would be unavailable for grazing. Livestock trailing would be allowed through a designated trailing corridor; however, additional effort would be required to ensure livestock did not remain in the ACEC overnight. Restrictions in areas available for livestock grazing would have negligible effects on grazing, similar to Alternative I.

Alternative V would designate 744,000 acres in the Sagebrush Sea ACEC. The entire ACEC would be available to grazing; however, grazing would be managed at a reduced utilization level with additional reductions through major adjustments to seasons-of-use and stocking rates. Considerable effort would be required to remove infrastructure and associated routes in response to the reduction in grazing and within reference areas.

Under Alternative V, the Lower Bruneau Canyon ACEC (1,000 acres) and the Sand Point ACEC (1,000 acres) would be unavailable to livestock grazing. The relatively small size and location of these ACECs would have negligible effects to forage availability at the allotment or planning area levels.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would designate 18,000 acres in the Upper Bruneau Canyon ACEC. Approximately 900 acres would be in areas available to livestock grazing. Areas unavailable to livestock grazing would be within the Bruneau River Canyon so would not affect livestock grazing. Adjustments to schedules, seasons-of-use, and stocking rates would be made if conflicts with relevant and important values were identified. Existing infrastructure would be evaluated for modification or retention and new infrastructure considered to the extent that it protects resource values. Salt and supplements would not be allowed in the ACEC. The relatively low numbers of acres and their location would result in a negligible impact to livestock grazing within the planning area. Designation of this ACEC would impact livestock grazing less than the No Action Alternative and Alternatives I and III due to the reduced size of the ACEC.

This alternative would designate 1,000 and 950 acres in the Lower Bruneau and Sandpoint ACECs, respectively. Management and impacts to livestock would be similar to those described for Alternative I.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

Livestock grazing would continue at or near current levels with allotment-specific allocation increases or decreases. Upland vegetation would generally be maintained in its current state with some increase in non-native perennial and native grasslands through conversion of annual grasses and emergency stabilization and burned area rehabilitation (ES&BAR) treatments. Relative to the action alternatives, the No Action Alternative would provide the most acres available to livestock grazing and have the fourth largest allocation of animal unit months.

Restrictions on management practices (e.g., season of use, grazing use criteria) and infrastructure are generally less prescriptive than Alternatives I, III, IV, V, and VI, providing more management options and flexibility to achieve resource objectives.

The No Action Alternative does the least to stabilize forage availability through wildland fire ecology and management actions, but also requires the least amount of effort to reduce conflicts between livestock grazing and wildland fire ecology and management actions.

The No Action Alternative provides a moderate level of forage availability for livestock and has a low level of limitations on infrastructure for livestock management, relative to the other alternatives. The level of effort required to minimize conflicts with livestock grazing would be low with regard to resources and high with regard to other uses. Overall, there would be moderate beneficial impacts to livestock grazing.

Impacts from Alternative I

Alternative I would provide the fifth most acres available for livestock grazing and fifth highest allocation of forage. Restrictions on livestock management actions (e.g., utilization, season of use, and infrastructure) to achieve special status species objectives and comply with Area of Critical Environmental Concern (ACEC) designations would decrease management flexibility and the scope of options available to achieve resource objectives relative to the No Action Alternative and Alternatives II and III. The size of the wild horse herd would increase allocation and management of allotments in the Herd Management Area (HMA) relative to the No Action Alternative and Alternative II, but would be less than required for Alternatives III and IV. Impacts from wild horses would be similar to Alternatives IV and VI.

Alternative I would rank third with regards to stabilizing forage availability through wildland fire ecology and management actions. Wildland fire ecology and management actions would provide a more balanced use of short- and long-term actions to bring the planning area into Fire Regime Condition Class (FRCC) 1. The use of native and non-native species in upland vegetation and ES&BAR treatments would maintain forage availability in burned and treated areas more than Alternatives IV and V, which would focus on use of native species only.

Impacts from travel designations and development of motorized recreational opportunities in the Deadman/Yahoo Special Recreation Management Area (SRMA) would be similar or slightly more than Alternatives III and IV because of a high number of acres of open play area, but would be less than the No Action Alternative.

Alternative I provides a moderate level of forage availability and limitation on infrastructure for livestock management, relative to the other alternatives. The level of effort required to minimize conflicts with livestock grazing would be low with regard to resources and other uses. Overall, there would be moderate beneficial impacts to livestock grazing under Alternative I.

Impacts from Alternative II

Alternative II would provide the second highest acres available for livestock grazing and the highest allocation of forage. The wild horse herd would be reduced to zero, eliminating competition for forage and water within the HMA. Restrictions on livestock management actions (e.g., utilization, season of use, and infrastructure) to achieve resource objectives would be similar to the No Action Alternative but less restrictive than Alternatives I, III, IV, V, and VI.

Management related to upland vegetation would focus more on maintaining forage available to livestock more than all other alternatives. Alternative II would have similar results as Alternatives III and IV for ensuring forage availability through wildland fire ecology and management actions. The development and use of Reserve Common Allotments would provide increased options to temporarily relocate livestock when allotments are being treated or have recently experienced wildland fire relative to the No Action Alternative, but similar to Alternatives III, IV, and VI.

Travel designations would decrease conflicts with recreation while maintaining or improving access for commercial activities relative to all alternatives. Alternative II would not designate motorized SRMAs so motorized impacts would be lower than all other alternatives.

Alternative II provides a high level of forage availability and low level of limitations on infrastructure for livestock management. The level of effort required to minimize conflicts with livestock grazing would be low with regard to resources and high with regard to other uses. Overall, there would be major beneficial impacts to livestock grazing under Alternative II.

Impacts from Alternative III

Alternative III would provide the third most acres available for livestock grazing (same as Alternative VI) and second highest allocation of forage. Restrictions on management actions (e.g., utilization, season of use, and infrastructure) to achieve special status species objectives would decrease management flexibility and the scope of options available to achieve resource objectives more than the No Action Alternative and Alternatives I, II, and VI, but less than Alternatives IV and V. ACEC management in Alternative III would require less effort to reduce conflicts with livestock grazing than any other alternative, except Alternative II which does not designate any ACEC. The appropriate management level (AML) is the highest of all alternatives and would require the most adjustments to allocation and management of allotments in the HMA. Impacts from wild horses would be similar to Alternative V except the herd would have breeding animals and require more gathers.

Alternative III would fall in the middle with Alternatives II and V with regards to stabilizing forage availability through wildland fire ecology and management actions. Wildland fire ecology and management actions would be similar to Alternative II, using strategic fuels management and increased forage allocation to reduce fire size across the planning area. The use of native and non-native species in

ES&BAR actions would restore forage and assist suppression efforts (e.g., strategic placement of fire-resistant species) similar to Alternative II but more than Alternatives IV and V.

Impacts from travel designations and development of motorized recreational opportunities in the Deadman/Yahoo SRMA would be similar to Alternatives I and IV, and more than the No Action Alternative and Alternatives II, VI, and V.

Alternative III provides a high level of forage availability and low level of limitations on infrastructure for livestock management. A moderate amount of effort would be required to minimize conflicts with livestock grazing with regard to resources and other uses. Overall, there would be moderate to major beneficial impacts to livestock grazing under Alternative III.

Impacts from Alternative IV

Alternative IV would allocate the second (Alternative IV-A) and third (Alternative IV-B) fewest acres and forage to livestock grazing in order to achieve special status species and ACEC objectives. Restrictions on livestock management actions (e.g., utilization, season of use, and infrastructure) would increase more than the No Action Alternative and Alternatives I, II, III, and VI, but less than Alternative V. The size of the wild horse herd would increase the adjustments to allocation and management of allotments in the HMA relative to the No Action Alternative and Alternative II, but would be less than Alternatives III and V. The effects of the horse herd would be similar to Alternatives I and VI but the herd would be non-reproductive so would require fewer gathers.

Alternative IV would rank second with regard to stabilizing forage availability through wildland fire ecology and management actions. Wildland fire ecology and management actions would use some short-term actions (i.e., create fuel breaks) but would focus more on using long-term actions (i.e., conversion from annual to native shrubland) to bring the planning area into FRCC 1. ES&BAR actions would use more native species than the No Action Alternative and Alternatives I through III to move vegetation communities from perennial grassland to native shrubland. Conversion to native shrubland would increase restrictions on livestock management actions relative to the No Action Alternative and Alternatives I through III.

Impacts from travel designations and development of motorized recreational opportunities in the Deadman/Yahoo SRMA would be similar to Alternatives I and III, and more than Alternatives II, V, and VI.

Alternative IV provides a low level of forage availability and high level of limitations on infrastructure for livestock management. A moderate amount of effort would be required to minimize conflicts with livestock grazing with regard to resources and other uses. Overall, there would be major adverse impacts to livestock grazing under Alternative IV.

Impacts from Alternative V

Alternative V allocates the fewest acres available for livestock grazing and the lowest allocation of forage in order to achieve special status species objectives and to provide for pasture-sized reference areas. Special status species and ACEC actions would restrict allocation and livestock management actions (e.g., utilization, season of use, and infrastructure) more than the other alternatives. The wild horse AML is the second highest of all alternatives, increasing the adjustments to allocation and management of allotments in the HMA.

Alternative V would rank fourth for stabilizing forage availability through wildland fire ecology and management actions, but requires the most effort to reduce conflicts between livestock grazing and wildland fire ecology and management actions. Wildland fire ecology and management actions would use more long-term actions (e.g., conversion from annual to native shrublands) with fewer short-term actions (e.g., fuel breaks) than all other alternatives to bring the planning area into FRCC 1. Upland vegetation and ES&BAR actions would use only native species and rely more on natural succession to move vegetation communities from perennial grassland to native shrubland. Conversion to native communities would increase restrictions on livestock management actions relative to all other alternatives.

Impacts from travel planning designations and development of motorized recreational opportunities would be lower than in any other alternative except Alternative II.

Alternative V provides the lowest level of forage availability and highest level of limitations on infrastructure for livestock management. The level of effort required to minimize conflicts with livestock grazing would be high with regard to resources and low with regard to other uses. Overall, there would be major adverse impacts to livestock grazing under Alternative V.

Impacts from Alternative VI (Proposed RMP)

Alternative VI would provide the fourth most acres available for livestock grazing and third highest allocation of forage. Restrictions on livestock management actions (e.g., utilization, season of use, and infrastructure) to achieve special status species objectives and comply with ACEC designations would decrease management flexibility and the scope of options available to achieve resource objectives relative to the No Action Alternative and Alternatives II and III. The size of the wild horse herd would increase adjustments to allocation and management of allotments in the HMA relative to the No Action Alternative and Alternative II, but would be less than required for Alternatives III and V. Impacts from wild horses would be similar to Alternatives I and IV.

Alternative VI would be the most successful alternative with regards to ensuring forage availability through wildland fire ecology and management actions. Wildland fire ecology and management actions would provide a more balanced use of short- and long-term actions to bring the planning area into FRCC 1. The use of native and non-native species in upland vegetation and ES&BAR treatments would maintain forage availability in burned and treated areas more than Alternatives IV and V.

Impacts from travel designations and development of motorized recreational opportunities in the Deadman/Yahoo SRMA would be less than Alternatives I, III, and IV, but would be more than the No Action Alternative and Alternative II.

Alternative VI provides a moderate level of forage availability and limitation on infrastructure for livestock management. The level of effort required to minimize conflicts with livestock grazing would be low with regard to resources and other uses. Overall, there would be moderate beneficial impacts to livestock grazing under Alternative VI.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Livestock operations depending on forage produced within the planning area also depend on forage produced on other Federal, State, and private lands within the region. Therefore, the cumulative impact analysis area includes the planning area and adjacent portions of the BLM Bruneau, Four Rivers, Burley, Shoshone, and Wells (NV) Field Offices; Humboldt-Toiyabe National Forest; Sawtooth National Forest; State lands; and private lands intermingled with and adjacent to the planning area.

Management actions, including on- and off-site mitigation, to meet habitat requirements for special status species would likely be the action taken with the highest potential to affect forage availability within the cumulative impact analysis area. Sage-grouse is the most prevalent special status species across the sagebrush steppe ecosystem and is often referred to as an umbrella species for indicating effects of management actions on other species. For this reason, sage-grouse will be an indicator used for cumulative impacts of management within the planning area and adjoining cumulative impact analysis area. The cumulative impacts analysis area includes identified sage-grouse habitat in the planning area and a 40-mile radius of the planning area. This distance was selected based on radio telemetry data indicating several sage-grouse within the planning area traveled from 20 miles up to 39 miles over a one-year period taking them well beyond the planning area. No data indicated sage-grouse leave the planning area and move north across the Snake River. However, a number of livestock grazing permittees within the planning area utilize Federally managed, State, and private lands in the BLM Four Rivers and Shoshone Field Offices, and the Minidoka and Fairfield Ranger Districts, so the cumulative effects

analysis area for livestock grazing was extended 40 miles from the planning area boundary into these field offices.

Actions taken by other Federal and State land management agencies would not have a direct influence on the availability of forage within the planning area as their rules, regulations, and policy would be applicable only to lands under their jurisdiction. However, decisions affecting forage availability on those lands would influence the importance of available forage within the planning area.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect livestock grazing:

- Wildland Fire Ecology and Management and
- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter.

With regard to wildland fire ecology and management, wildland fire and fuels management has played and is expected to continue to play a major role in forage availability within the planning area and will have similar effects on intermingled and adjoining landownership. Loss of forage on Federal lands during periods of recovery following wildland fire, drought, or restoration treatments will place additional burden on limited forage produced on other land ownership. Recent history has demonstrated sources of forage on State and private lands are affected by the same natural events influencing forage availability on Federal lands within the analysis area. Typically, these sources of forage are utilized annually and are not excess forage. Use of these forage sources to replace forage no longer available within the planning area creates another void that must be filled, often resulting in shortages or elevated prices of private pasture or hay. The larger the wildland fire or the more intense and widespread the drought, the wider the demand and search for alternate forage.

Land use authorizations (e.g. energy development) on other Federally managed, State, and private lands would affect traditional forage sources on developed lands as well as livestock grazing management within the planning area. Cumulative impacts of development on special status species habitat on all ownerships within and immediately adjacent to the planning area would be considered in determining mitigation actions that would affect forage and lands available to livestock grazing. Proposed wind energy projects in the cumulative impact analysis area have the highest potential to affect forage availability and management options. Relative to potential oil and gas development in the same area, wind energy projects have a higher potential for development, would have a larger footprint (e.g., actual acres disturbed during project development and operation) and would cover a more extensive area. Generally, forage availability within the project areas would remain similar to or below current levels. The off-site mitigation that would likely occur on neighboring allotments to offset habitat degradation and loss within the project area would decrease forage availability and management options on those allotments.

Livestock grazing has occurred in the cumulative impact analysis area since the 1870s. Originally unregulated, unintended damage to soil, plants, streams, and springs occurred. Beginning in 1897 the Forest Service, and then the BLM (then the US Grazing Service) in 1934, began regulating livestock grazing on Federally managed land. Within the cumulative impact analysis area there are all or parts of 372 allotments. The majority of the allotments are grazed by cattle, sheep, or a combination of the two kinds of livestock.

Livestock grazing occurs on and is expected to continue on most private, Federal and State managed lands in the planning and cumulative impact analysis area. Livestock grazing is expected to increase or remain static on private lands, and to remain static on adjoining public lands

Table 4-335. Livestock Grazing Allotments on Public Lands within the Cumulative Impact Analysis Area

Administrative Unit	Number of Allotments
Bruneau Field Office	37
Burley Field Office	104
Four Rivers Field Office	70
Jarbidge Field Office	93
Owyhee Field Office	8
Tuscarora Field Office	29
Shoshone Field Office	131
Wells Field Office	32
Fairfield Ranger District	10
Jarbidge Ranger District	23
Mountain City Ranger District	49

Table 4-336 shows the acres of wildland fire within the 40-mile cumulative impact analysis area for livestock grazing between 1987 and 2011. Though it is not represented in the table, many of these areas have burned multiple times during this time period.

Table 4-336. Wildland Fire within the Cumulative Impact Analysis Area

Administrative Unit	Wildland Fire Footprint (Acres)
Bruneau Field Office	162,000
Burley Field Office	69,000
Four Rivers Field Office	352,000
Jarbidge Field Office	1,146,000
Owyhee Field Office	14,000
Tuscarora Field Office	73,000
Shoshone Field Office	346,000
Wells Field Office	541,000
Mountain Home Ranger District	38,000
Fairfield Ranger District	105
Jarbidge Ranger District	66,000
Mountain City Ranger District	104,000

[A] Numbers represent the acres of wildland fire within the administrative boundaries regardless of ownership or frequency. Numbers have been rounded to the nearest 1,000.

Approximately 11 small wind energy projects have been constructed on private land in the Bell Rapids, Cassia Gulch, Yahoo and Magic Waters areas south and west of Hagerman, and nine projects on private lands north and west of Hammett. These projects included rights-of-way (ROWs) for related infrastructure (roads and transmission lines) where they cross public land. Wind turbines have also been installed within the cumulative impacts analysis area on private land west of Burley near Milner Butte. Projects described south and west of Hagerman are not within five miles of sage-grouse leks. The area has burned several times since 1993 and essentially no sagebrush is present. The Milner Butte project is about four miles north of an unknown status lek which was active when last checked in 2006. The lek is on private land and is currently being farmed. Wind energy projects north and west of Hammett are within five miles of one active and two status-undetermined sage-grouse leks, the remainder are greater than five miles from leks.

New land use authorizations have been proposed in or adjacent to the planning area and are in various stages of consideration by affected landowners.

A feasibility proposal has submitted to Federal Energy Regulatory Commission for a small hydro energy facility on public, State, and private lands in the China Creek area. Information is lacking on the project size and infrastructure but the project area is within five miles of one unknown status sage-grouse lek.

A number of wind energy proposals have been made on BLM and private land within the cumulative impact analysis area but it is unknown if all the projects would be constructed. Three wind energy sites are within the Bruneau Field Office boundary, six in the Burley Field Office, seven in the Jarbidge Field Office, and two in the Wells (NV) Field Office, one being shared with the Jarbidge Field Office. The majority of the private land is farmed or used for livestock grazing. A large portion of privately owned rangeland was treated (brush removal and seedings) years ago to improve forage production for livestock.

A large wind energy project has been proposed near China Mountain in southeastern portion of the planning area and northern Nevada. An EIS was started for this project but is currently on hold. If the project were to proceed it would occupy 31,000 acres of higher elevation late brood and winter sage-grouse habitat on public, State, and private lands.

Four small wind energy projects have been proposed in the northern part of the planning area west of Hagerman. All of the projects would be on private lands except for three to four turbines on BLM land. Currently, the majority of private land is being farmed, and the remaining is rangelands great than 10 miles from an occupied lek or sage-grouse habitat.

Portions of the proposed routes for the Gateway West transmission line are located within the cumulative impact analysis area in the Bruneau, Burley, and Four Rivers Field Offices. Within the planning area one route would be located near Lily Grade and then continue north on the west side of Salmon Falls Creek to the Blue Gulch area then west across the northern portion of the planning area in to the Bruneau and Four Rivers Field Offices. An alternate route crosses Salmon Falls Creek near Balanced Rock and then would continue north and west across the northern portion of the planning area as described for the other route. Portions of the proposed routes through all BLM field offices would be located in sage-grouse habitat.

Southwest Intertie Project (SWIP) is a project that would construct a north/south transmission line in the Burley and Wells (NV) Field Offices. Reaches of the SWIP ROW located in the Burley Field Office and the Wells (NV) Field Office immediately south of the Idaho/Nevada State line are within one mile of the planning area. Portions of the existing ROW are located in sage-grouse habitat.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

The No Action Alternative would be the third highest allocation of forage to livestock grazing. Allocations and management in this alternative would maintain or provide opportunities to increase forage availability on State and private lands within the planning area. Forage availability on Federal, State, and private lands within the cumulative impact analysis area is expected to remain relatively constant within the foreseeable future.

The No Action Alternative is ranked the lowest of the alternatives for decreasing effects of wildland fire on forage available to livestock grazing, with the current trend of larger wildland fires predicted to continue. The instability of available forage resulting from large and frequent wildland fires would increase demands for forage available on State and private lands both within the planning and cumulative impact analysis areas. Additionally, wildland fire affecting BLM-managed lands would likely reduce available forage on State and private lands intermingled in BLM allotments. The trend of larger and more frequent wildland fires in the cumulative impact analysis area is similar to that described for the planning area. Loss of forage in burned areas would be temporary but would require acquiring alternative forage during that period. During years when wildland fire occurs both within the planning and cumulative impact analysis areas the need for alternative sources of livestock feed would be compounded, increasing competition for a limited resource, creating supply shortages, increased prices, and potentially requiring downsizing or selling of entire herds.

More acres are available and guidelines less restrictive for energy and ROW development than all other alternatives except Alternative II. Because there are fewer restrictions, more acres within special status species habitat with potential for energy development would be available. Energy development on State

and private lands with special status species habitat is expected to continue both within the planning area and in the cumulative impact analysis area. Loss or degradation of special status species habitat in these project sites would result in mitigating actions that decrease forage availability on BLM-managed lands by changing allocations, seasons-of-use, and utilization limits. These restrictions would not occur on State managed or private lands. Conversely, it would be reasonable to expect these lands to be managed to increase forage production and infrastructure to compensate for decreased forage on Federally managed lands both within the planning and cumulative impact analysis areas.

Cumulative Impacts from Alternative I

Alternative I would provide the fifth highest allocation of forage to livestock grazing. Forage availability and management options on BLM-managed lands would generally maintain forage availability on intermingled State and private lands. Restrictions to livestock management related to meeting sage-grouse habitat requirements that decrease available forage within the planning area would have localized effects on adjoining or intermingled land ownership.

Wildfire would be expected to continue within the planning area, creating short-term demands for forage on State and private lands. However, decreased starts and reduced fire size would benefit all ownerships by stabilizing forage availability. Effects of wildland fire in the cumulative impact analysis area would be expected to be similar to those described for the No Action Alternative.

Wind energy would be allowed in special status species habitat within the planning area if effects could be mitigated. Mitigation within the planning area would be expected to be implemented within the project area and on adjoining allotments. Loss of available forage due to reduced allocation, changes in seasons-of-use, or periods of rest in areas being treated to improve habitat would increase the importance of forage available on State and private lands, both within the planning area and the cumulative impact analysis area. It would also be expected that authorized activities on adjoining Federally managed lands would be affected by actions to mitigate loss or degradation of habitat due to energy project development in the planning area. Energy development on State and private lands with special status species habitat may result in mitigating actions on BLM-managed lands that would decrease forage availability similar to those described in the No Action Alternative.

Cumulative Impacts from Alternative II

Alternative II would provide the highest allocation of forage to livestock grazing relative to the other alternatives. Alternative II would also provide the most opportunity to increase forage availability on intermingled State and private lands within the planning area by providing the most opportunity for vegetation management that would increase production, and development of new infrastructure on public lands that may facilitate development and improvement of private and state lands. Increasing available forage within the planning area would reduce interest in acquiring new or improving existing sources of forage on State and private lands within the cumulative impact analysis area.

Wildland fire management is expected to decrease fire size in the short term but over the long-term continue the trend to larger fires. Large fires would continue to destabilize the availability of forage on BLM and intermingled State and private lands within the planning area, increasing demand for sources of forage in the cumulative impact analysis area. The trend of wildland fire in the cumulative impact analysis area and the effects on forage availability would be similar to that described for the No Action Alternative.

Alternative II would provide the most opportunity for commercial development within the planning area of all the alternatives, potentially creating conflict and competition for limited resources between users within both the planning and cumulative impact analysis areas. Areas and forage available to livestock grazing would be affected if intense development was to occur in special status species habitat and mitigation was necessary because of loss or degradation of habitat. Effects to livestock grazing from mitigating actions for energy development would be similar to the No Action Alternative but because of this alternatives emphasis on commercial development effects would be somewhat higher.

Cumulative Impacts from Alternative III

Alternative III would provide the second highest allocation of forage to livestock grazing, with similar cumulative impacts to livestock grazing within the planning area and cumulative impact analysis area as described for Alternative II.

Alternative III would result in moderate beneficial impacts by reducing the number and size of wildland fires. Impacts from wildland fire on State and private lands within the planning area would decrease over the short term, stabilizing forage bases and decreasing operational costs. Stabilizing forage within the planning area would also decrease the necessity to secure alternate forage outside the planning area. This would primarily benefit management on State and private lands but would also improve coordination of grazing management on adjoining Federally managed lands. Effects of wildland fire in the cumulative impact analysis area on livestock grazing would be similar to those described for the No Action Alternative.

Effects on forage availability from reasonable and foreseeable wind energy development would be similar to those described for Alternative I.

Cumulative Impacts from Alternative IV

Alternative IV would provide the second (Alternative IV-A) and third (Alternative IV-B) lowest allocation of forage to livestock grazing, emphasizing management for special status species habitat and Areas of Critical Environmental Concern objectives. Decreased forage availability due to reduced allocation would require long-term resolutions to replace forage. Decreased forage availability and the removal of infrastructure in areas unavailable for grazing would decrease available forage on intermingled State and private lands. Interest in managing these lands separately to avoid restrictions on BLM-managed lands would increase. Forage production and infrastructure on these lands would be managed to compensate for decreased forage on BLM-managed lands. Due to the isolation of much of the State and private lands within the planning area it would not be economical to invest in the infrastructure necessary to manage most of these lands separately. The State of Idaho could see these grazing leases relinquished, resulting in a loss of revenue to State endowments. Based on personal conversations with landowners, not being able to economically utilize resources on these isolated tracts of land would devalue the properties for livestock grazing, potentially resulting in these lands being converted to recreational properties. Interest in forage sources outside the planning area would increase. Increased forage is not likely to be made available on other Federally managed lands in the cumulative impact analysis area, so the majority of pressure would be on forage sources from State and private lands.

Alternative IV would rank second with regard to stabilizing forage availability through wildland fire ecology and management actions so it is expected demand on alternative sources of forage would decrease both within the planning area and the cumulative impact analysis area. When wildland fire does occur, more restrictive guidelines for temporary fences used to protect recovering burned areas would decrease forage availability on unburned areas, requiring permittees to pursue forage produced on State and private lands within and adjacent to the planning area. Effects of wildland fire on livestock grazing within the cumulative impact analysis area would be expected to be similar to those described for the No Action Alternative.

The effects of mitigating for habitat loss or degradation due to wind energy projects would be similar to those described for Alternative I except the emphasis on managing for special species habitat would be much higher and management would be much more restrictive within the planning area. As a result, management affecting seasons-of-use, allocations, and utilization limits, would likely result in larger decreases of forage availability within the planning area to mitigate habitat loss or degradation in the cumulative impact analysis area. Increased demand for forage available on State and private lands within the planning area and in the cumulative impact analysis area would be expected to increase. As described above, interest in managing these lands separately from Federally managed lands would increase, but the same limitations due to isolation and economics would apply.

Cumulative Impacts from Alternative V

Alternative V allocates the least amount of forage to livestock grazing of all alternatives. Decreases of forage availability associated with reduced allocation rates would require long-term resolution to replace forage no longer available. Decreased forage availability on BLM-managed lands would also decrease available forage on intermingled State and private lands unless these lands were fenced and managed separately. Managing many of the isolated tracts of State and private lands separately would be limited by economics as described for Alternative IV. Interest in sources of forage outside the planning area would increase. Increased forage is not likely to be made available on other Federally managed lands in the cumulative impact analysis area so the majority of pressure would be on alternative forage sources from private and State lands.

Alternative V would rank fourth for stabilizing forage availability through wildland fire ecology and management actions. Wildland fire would decrease forage availability and increase operational costs on all land ownership. Temporary fences used to protect recovering burned areas and rehabilitation treatments would not be allowed, decreasing forage availability in unburned areas within allotments affected by fire. The decrease in available forage in this alternative would create the highest demand for forage available on other land ownerships within the planning area and cumulative impact analysis area. A limited supply and high demand would increase costs to replace forage no longer available in the planning area. Effects of wildland fire in the cumulative impact analysis area would be expected to be similar to those described for the No Action Alternative.

Energy development on State and private lands with special status species habitat would result in mitigating actions that would decrease forage availability on BLM-managed lands similar to those described for Alternative IV. However, due to the reduced level of grazing in this alternative, mitigating measures may not result in reductions or changes in management as large as what would occur in alternatives with higher levels of grazing.

Cumulative Impacts from Alternative VI (Proposed RMP)

Alternative VI would provide the third highest allocation of forage to livestock grazing. Forage availability on BLM-managed lands within the planning area would generally maintain forage availability on intermingled State and private lands. Restrictions to livestock management related to meeting sage-grouse habitat requirements that decrease available forage within the planning area would have localized effects on adjoining or intermingled land ownership.

Effects of wildland fire in the cumulative impact analysis area would be expected to be similar to those described for the No Action Alternative.

Within the planning area wind energy development would not be allowed in the sage-grouse management area reducing effects of mitigation described for the other alternatives. Energy development on State and private lands adjoining the planning area would be expected to continue; potentially resulting in mitigation on BLM-managed lands within the planning area. Authorized activities on adjoining Federally managed lands would be affected by actions to mitigate loss or degradation of habitat due to energy project development in the planning area. Energy development on State and private lands with special status species habitat would likely result in mitigating actions on BLM-managed lands that would decrease forage availability similar to those described in the No Action Alternative.

4.4.2. Recreation

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to recreation:

- **Acres with focused recreation management -** Recreation Management Areas (RMAs) provide focused recreation management in specific land units. This management can provide and enhance recreational experiences.

- **Type of recreation opportunities -** The types of recreation activities provided by a specific geographic area (i.e. hunting, nature study, off-highway vehicle [OHV] riding, etc.)
- **Number of recreation opportunities -** the number of targeted recreation activities emphasized in Special Recreation Management Areas, etc.
- **Recreation opportunity setting -** this includes the physical, social, and administrative setting

Methods and Assumptions

Impacts to recreation from management in the following sections of Chapter 2 were analyzed in detail: *Recreation, Wildland Fire Ecology and Management, Lands with Wilderness Characteristics, Transportation and Travel, Land Use Authorizations,* and *Areas of Critical Environmental Concern.* Impacts from management in the *Land Tenure* section was not analyzed in detail as acquisitions or disposals of BLM-managed lands could be provided for continued public access and recreation through mechanisms such as reserving public rights-of-way. The only identified potential disposal of BLM-managed lands with concentrated recreation use is in Alternative II. In that alternative, the Deadman and Yahoo areas could be transferred by exchange or Recreation and Public Purposes Act leases to the State, counties, or local communities for development of motorized recreation areas, which is the primary recreation use on these lands. In this case, the lands would still be available for public recreation as approved by the BLM, and the impact of the transfer on recreation use would be minimal. Impacts from management in the Minerals section were not analyzed in detail because development would occur at specific locations that are not known at this time. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for recreation. Impacts from management for recreation can be found under Impacts from Recreation Actions in the *Water Resources, Riparian Areas and Wetlands, Fish, Wildlife, Special Status Fish and Aquatic Invertebrates, Special Status Wildlife, Wildland Fire Ecology and Management, Cultural Resources, Lands with Wilderness Characteristics, Transportation and Travel, Wilderness, Social Conditions,* and *Economic Conditions* sections.

Impacts to recreation are characterized by assessing changes in recreation opportunities, activities, and experiences associated with the management of resources and uses described below. Because recreators participate in a diverse set of activities for a variety of reasons, specific management actions may simultaneously adversely and beneficially impact recreation opportunities depending on an individual's desired experience. The type and degree of change are measured using the impact indicators listed above. The analysis and conclusions are based on BLM knowledge of resources in the planning area, review of existing literature, information provided by other agencies, and professional judgment. Effects are quantified where possible, using numbers of acres to quantify particular changes. Where impacts are focused on or specific to certain recreation activities, the affected activities are listed. In the absence of quantitative data, impacts are described using ranges of potential impacts or in qualitative terms. Changes are compared to the existing situation using terms such as "change," "no change," "increase," and "decrease."

The following assumptions were used when analyzing impacts to recreation:

- Designation and management of an RMA would provide the setting for the identified recreation opportunities.
- Some recreation opportunities are at least partially incompatible with others in the same area (e.g., intense OHV use and hiking).
- Continuing population growth in the surrounding region will increase future demand for recreation opportunities in the planning area, ultimately increasing visitor use numbers.
- New forms of recreation that are not an issue today may evolve into recreation issues over the life of the plan.
- Special Recreation Permits (SRPs) provide a tool to manage commercial, competitive, and organized events as well as concessions and special use areas. Terms and conditions would be included in all SRPs that would reduce impacts from these activities, in comparison to allowing these activities to take place with no restrictions.

Direct and Indirect Impacts

Impacts from Recreation Actions

The following indicators were used to analyze the impacts of Recreation actions to recreation:

- Acres with focused recreation management (Special Recreation Management Areas [SRMAs] and Extensive Recreation Management Areas [ERMAs]),
- Type of recreation opportunities, and
- Number of recreation opportunities.

Recreation and visitor services are designed to manage issues, concerns, and existing and potential recreational opportunities identified by the BLM, other agencies, organizations, or the general public. The Recreation Management Area (RMA) is a land unit where Recreation and visitor services objectives are recognized as a primary resource management consideration and specific management is required to protect the recreation opportunities. RMAs are designated as either a SRMA or an ERMA. SRMAs recognize unique and distinctive recreation values and are managed to enhance a targeted set of activities, experiences, benefits, and recreation setting characteristics, which becomes the priority management focus. ERMAs recognize existing recreation use, demand, or Recreation and visitor services program investments and are managed to sustain principle recreation activities and associated qualities and conditions of the ERMA, commensurate with other resources and resource uses.

The majority of BLM-managed lands are not designated as RMAs, and generally provide for dispersed recreation opportunities. Recreation is not the predominant management emphasis, but is part of the balance of management considerations. Recreation management in lands not designated as RMAs are custodial in nature and takes place to provide for health and safety, resource protection, and address use and user conflicts.

Management actions for recreation or other resources or uses may affect the recreation opportunity setting. Recreation opportunity settings are based upon a variety of physical, social, or administrative attributes such as remoteness, the amount of human modification in the natural environment, evidence of other users, and restrictions and controls.

Table 4-337 displays the number of acres allocated to SRMAs and ERMAs by alternative.

Table 4-337. Special Recreation Management Areas and Extensive Recreation Management Areas by Alternative (Acres)

RMA	Alternative						
	No Action	I	II	III	IV	V	VI
SRMA							
Balanced Rock	0	500	0	500	0	0	500
Bruneau-Jarbidge	57,000	0	0	0	0	0	0
Canyonlands	0	149,000	0	0	149,000	0	0
Deadman	0	0	0	0	0	0	13,000
Deadman/Yahoo	0	36,000	0	34,000	34,000	0	0
Jarbidge Foothills	0	133,000	0	0	0	0	0
Jarbidge Forks	4,000	2,000	2,000	2,000	2,000	2,000	2,000
Little Pilgrim	0	300	300	300	0	0	300
Oregon Trail	16,000	0	0	0	0	0	0
Salmon Falls Creek	6,000	0	0	0	0	0	0
Salmon Falls Reservoir	0	5,000	5,000	5,000	5,000	0	1,000
Yahoo (Hagerman-Owsley Bridge)[A]	3,000	0	0	0	0	3,000	3,000
SRMA Total Acres	**86,000**	**325,000**	**7,000**	**42,000**	**190,000**	**5,000**	**20,000**

RMA	Alternative						
	No Action	I	II	III	IV	V	VI
ERMA							
Canyonlands	0	0	0	0	0	0	149,000
Jarbidge Foothills	0	0	0	0	0	0	133,000
Luds Point	0	0	0	0	0	0	3,000
Rosevear	0	0	0	0	0	0	19,000
ERMA Total Acres	**0**	**0**	**0**	**0**	**0**	**0**	**304,000**
Lands Not Designated as RMAs	**1,285,000[B]**	**1,046,000**	**1,364,000**	**1,329,000**	**1,181,000**	**1,366,000**	**1,047,000**

[A] Hagerman-Owsley Bridge is the name used in the 1987 Jarbidge RMP; the same area would be called Yahoo in the action alternatives.
[B] Lands not designated as RMAs were not specifically identified in the No Action Alternative; however, the intent of the 1987 Jarbidge RMP was to consider recreation as a component of the overall management of resource uses.

Table 4-338 lists the primary activities identified for focused management in the SRMA management matrices (Appendix H) and the number of acres with management provided for that activity. These acres are identified for each alternative to display changes in managed recreation opportunities. The acres depicted for each activity do not mean that the activity will transpire over all the acres displayed or that those activities would not be allowed elsewhere, but is used to display relative increases or decreases in areas managed for that specific opportunity.

Table 4-338. Special Recreation Management Areas with Focused Management for Specific Recreation Opportunities by Alternative (Acres)

SRMA Primary Activities	Alternative						
	No Action	I	II	III	IV	V	VI
4X4 Driving	0	18,000	0	18,000	18,000	0	0
Bird Hunting	0	300	300	300	0	0	300
Boat Launching and Take-Out	0	3,000	3,000	3,000	3,000	0	1,000
Camping	4,000	5,000	5,000	5,000	5,000	2,000	3,000
Equestrian	0	285,000	0	0	149,000	0	0
Fishing	63,000	155,000	5,000	5,000	155,000	0	1,000
Hiking	13,000	285,000	0	500	149,000	0	500
Historical Interpretation, Non-Motorized	7,000	0	0	0	0	0	0
Hunting	63,000	289,000	4,000	4,000	154,000	0	1,000
Mountain Biking	0	135,000	0	0	0	0	0
Nature Study	6,000	0	0	0	0	0	0
Non-Motorized Boating	0	500	0	500	0	0	500
Off-Highway Vehicle Riding [A]	3,000	36,000	0	34,000	34,000	3,000	16,000
Picnicking	4,000	2,000	2,000	2,000	2,000	2,000	2,000
Primitive, Boat-In Camping	0	2,000	2,000	2,000	2,000	0	0
Viewing Wildlife and Natural Scenery	61,000	289,000	4,000	5,000	154,000	2,000	3,000
Water Sports	0	2,000	2,000	2,000	2,000	0	1,000
Whitewater Boating	61,000	2,000	2,000	2,000	2,000	2,000	2,000
Wild Horse Viewing	0	18,000	0	18,000	18,000	0	0
Number of Primary Activities	**11**	**17**	**10**	**15**	**14**	**5**	**12**

[A] All-terrain vehicle, motorcycle, and utility task vehicle riding have been combined into OHV Riding because of the recognition and management of use as similar in nature.

Table 4-339 summarizes the anticipated changes to recreation opportunity setting within SRMAs as prescribed in the SRMA matrices in Appendix H. These changes to setting would occur in each action

alternative in which the specific SRMA (including Recreation Management Zones [RMZs]) would be designated.

Table 4-339. Anticipated Changes to Recreation Opportunity Settings in Special Recreation Management Areas for Alternatives I through VI (Proposed RMP)

SRMA		Alternative(s)	Expected Changes in Physical, Social, and Administrative Settings
Balanced Rock		I, III, and VI	An increase of developed trails, signs, and visitor services would accommodate hiking and interpretation within the canyon. Contacts with groups and group size would be expected to increase. Maps, brochures, and informational signing would be provided. On-site management presence would be increased.
Canyonlands		I and IV	An increase in contacts with other visitors or small groups would be anticipated. Maps and regulatory signing would be available. Use restrictions would be implemented to maintain and protect natural and cultural resource values
Deadman/Yahoo	Deadman RMZ	I, III, and IV	Development of facilities such as parking, toilets, and informational/regulatory signage would be provided. The evidence of use, group encounters, and group size would increase. On-site management and law enforcement presence would increase. Area-specific maps and brochures would be provided.
	Pasadena RMZ	I	
	Yahoo RMZ	I, III, and IV	
	Deadman	VI	Same as Deadman RMZ.
	Rosevear Gulch RMZ	I, III, and IV	Designated trails and regulatory/directional signage would be provided. The evidence of use, group encounters, and group size would increase. On-site management and law enforcement presence would increase. Area-specific maps and brochures would be provided.
	Little Pilgrim	I, II, III, and VI	Parking and toilets would be installed. Access on designated roads would be improved. An increase in contacts with other visitors or small groups would be anticipated. On site management and law enforcement presence would increase. Area specific maps and brochures would be provided. Use restrictions would be implemented to maintain and protect natural and cultural resource values.
	Jarbidge Foothills	I	An increase in contacts with other visitors or small groups would be anticipated. Maps and regulatory signing would be available. Use restrictions would be implemented to maintain and protect natural and cultural resource values.
	Jarbidge Forks	I, II, III, IV, V, and VI	Administrative and maintenance personnel presence would increase.
Salmon Falls Reservoir	Antelope Bay RMZ	I, II, III, IV, and VI	Facilities such as parking, toilets, boat ramps, and camping areas would be installed. Directional, interpretive, and regulatory signage would be provided. Access and condition of designated roads would be improved. The evidence of use, group encounters, and group size would increase. On-site management and law enforcement presence would increase. Area-specific maps and brochures would be provided.

SRMA		Alternative(s)	Expected Changes in Physical, Social, and Administrative Settings
Salmon Falls Reservoir	Cedar Creek RMZ	I, II, III, IV, and VI	An increase in contacts with other visitors or small groups would be anticipated. On-site management and law enforcement presence would increase. Area-specific maps and brochures would be provided.
	Luds Point RMZ	I, II, III, and IV	Access on designated roads would be created or improved. Parking and toilets would be installed. The evidence of use, group encounters, and group size would increase. Directional and regulatory signage would be provided On-site management and law enforcement presence would increase. Area-specific maps and brochures would be provided.
	Yahoo	V and VI	Development of facilities such as parking, toilets, and informational/regulatory signage would be provided. The evidence of use, group encounters, and group size would increase. On-site management and law enforcement presence would increase. Area-specific maps and brochures would be provided.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would continue to manage 86,000 acres as five separate SRMAs. This would be the third most SRMA acres of the alternatives, with 11 identified primary recreation opportunities. This alternative would continue existing management, and there would be no additional impact to the acres allocated for focused recreation management.

The SRMAs were not clearly delineated or mapped in the 1987 Jarbidge RMP, even though acres were allocated for each SRMA and the SRMA names provide a rough indication of where focused recreation management was intended. Development of Recreation Activity Management Plans would provide some focus and direction for these areas; however, managing SRMAs without clearly established boundaries would not allow for accommodation of demand for recreational resources as stated. The recreation opportunity type and number would remain unchanged because new and increasing recreation demand would not be accommodated. Without clearly defined boundaries, recreation opportunity settings in these areas could change due to resource uses or resource protections.

Portions of the planning area receive high levels of recreation use outside these SRMAs. Because special recreation management would not provide for this use and the affected areas would continue to be managed as part of the 1,285,000-acre lands not designated as RMAs, the recreation demand and use may not be adequately accommodated. This would increase user and resource conflicts throughout these areas. Altered natural resources may result in a change to recreation opportunity settings.

Impacts from Management Common to All Action Alternatives

Recreation management actions would have impacts related to specified natural resource protection, while providing for recreation use and visitor safety.

- Through monitoring and management actions, the type, number, and settings of recreation opportunities may be changed depending on specific needs.
- Resource protection methods could alter the type, decrease the number, and maintain or improve the natural setting of recreation opportunities.
- Opportunity type may be restricted, number may decrease, and setting may be maintained or improved to meet riparian objectives.
- Opportunity type may change and opportunity number may decrease within areas specified for closures or limitations on dispersed camping.
- Recreation opportunity type, number, and setting may be supported by fees, but would not be anticipated to be changed if a fee structure were to be implemented.

- Special Recreation Permits (SRPs) may provide equipment and skilled guides through an outfitter for a particular experience, thus increasing the number of available opportunities. Recreation opportunity settings may change in a social contact aspect with increased group size (e.g. increased encounters per day and evidence of use in some areas).

Impacts from Management Specific to Alternative I

Alternative I would manage 325,000 acres as seven separate SRMAs. This would be the most SRMA acres of the alternatives, with 17 identified primary recreation opportunities. This alternative would also have the broadest range of activity type among all alternatives. Some existing uses without focused recreation management under the No Action Alternative would have designated management provided in Alternative I. These uses include OHV riding in the Pasadena, Deadman, and Rosevear areas and the fishing and boating activities at Cedar Creek Reservoir, Little Pilgrim Gulch, and Salmon Falls Reservoir. Changes to recreation opportunity settings would be specific to individual SRMAs.

This alternative would provide for 1,045,000 acres managed as non-RMA lands. The management objectives would provide for basic public information, access, and minimal facilities, while ensuring public health and safety, reducing user conflicts, and protecting natural resources. This would be similar to current management of these lands and would have only minor impacts on recreation when compared to existing conditions.

The issuance and management of SRPs would have no impact to the acres allocated for focused recreation management, due to the terms and conditions that would be required for SRP activities. Recreation opportunity type may change based upon available commercial services that are provided through the SRP. SRPs may provide equipment and skilled guides through an outfitter for that particular experience, thus increasing the number of available opportunities. Recreation opportunity settings may change in a social contact aspect with increased group size (e.g. increased encounters per day and evidence of use in some areas).

Impacts from Management Specific to Alternative II

Alternative II would manage 7,000 acres as three separate SRMAs. This would be the second fewest SRMA acres of the alternatives, with 10 identified primary recreation opportunities. The SRMAs would maintain or enhance some existing opportunities, while minimizing conflict with resource uses. Some existing uses without focused recreation management under the No Action Alternative would have designated management provided in Alternative II. These uses include the fishing and boating activities at Cedar Creek Reservoir, Little Pilgrim Gulch, and Salmon Falls Reservoir. There would be no SRMAs managed for motorized recreation use. Changes to recreation opportunity settings would be specific to individual SRMAs.

Partnerships with the State, counties, or local communities for the creation of OHV parks at the Deadman and Yahoo areas under authorities such as the Recreation and Public Purposes Act, would provide areas available to the public with focused management for this opportunity. This would not affect SRMA acreage, because these areas would no longer be managed by the BLM. The recreation opportunity type and number would remain the same as in the No Action Alternative. The setting prescribed for these particular areas would change due to increased users, surface disturbance, and associated facilities.

This alternative would provide for custodial recreational management of 1,364,000 acres as non-RMA lands. Impacts from this management are the same as described for Alternative I.

The impacts to the type, number, and setting of recreation opportunities resulting from SRP management would be the same as those described for Alternative I.

Impacts from Management Specific to Alternative III

Alternative III would manage 42,000 acres as five separate SRMAs. This would be the fourth fewest SRMA acres of the alternatives, with 15 identified primary recreation opportunities. The SRMAs would maintain or enhance existing opportunities. Some existing uses without focused recreation management under the No Action Alternative would have designated management. These uses include OHV riding in

the Deadman and Rosevear areas and the fishing and boating activities at Cedar Creek Reservoir, Little Pilgrim Gulch, and Salmon Falls Reservoir. Changes to recreation opportunity settings would be specific to individual SRMAs.

This alternative would provide for custodial recreational management of 1,329,000 acres allocated as non-RMA lands. Impacts from this management are the same as described for Alternative I.

To limit recreation-related fire starts, priority would be granted to SRPs for activities occurring outside the fire season. The issuance and management of SRPs would have no impact to the acres with focused recreation management. Seasonal and overnight limitations on recreation permits would decrease the number and types of opportunities available during those times. SRPs may provide equipment and skilled guides through an outfitter for a particular experience, thus increasing the overall number or type of available opportunities. The opportunity setting may change in a social contact aspect with increased group size.

Impacts from Management Specific to Alternative IV

Alternative IV would manage 190,000 acres as four separate SRMAs. This would be the second most SRMA acres of the alternatives, with 14 identified primary recreation opportunities. The SRMAs would maintain or enhance existing opportunities, including providing focused recreation management for OHV riding in the Deadman and Rosevear areas and fishing and boating at Cedar Creek and Salmon Falls Reservoirs; however, existing fishing and boating activities at Little Pilgrim Gulch would not have designated management provided. Changes to recreation opportunity settings would be specific to individual SRMAs.

This alternative would provide for custodial recreational management of 1,181,000 acres as non-RMA lands. Impacts from this management are the same as described for Alternative I.

The issuance and management of SRPs would have no impact to the acres allocated for focused recreation management because of the terms and conditions required for SRP activities. Recreation opportunity type may be limited through an SRP to support conservation of natural and cultural resource values. Recreation opportunity settings may change in a social contact aspect with increased group size (e.g. increased encounters per day and evidence of use in some areas).

Impacts from Management Specific to Alternative V

Alternative V would manage 5,000 acres as two separate SRMAs. This would be the fewest SRMA acres of the alternatives, with five identified primary recreation opportunities. The SRMAs would maintain portions of existing opportunities, while allowing for restoration of resources. As a result, some existing uses would not have designated management provided, such as OHV riding in the Deadman and Rosevear areas and the fishing and boating activities at Cedar Creek Reservoir, Little Pilgrim Gulch, and Salmon Falls Reservoir. Changes to recreation opportunity settings would be specific to individual SRMAs.

This alternative would provide for custodial recreational management of 1,366,000 acres as non-RMA lands. Impacts from this management are the same as described for Alternative I.

The impacts to the acres with focused recreation management and type, number, and setting of recreation opportunities resulting from SRP management would be the same as those described for Alternative IV.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would manage 20,000 acres as six separate SRMAs. This would be the third fewest SRMA acres of the alternatives, with 12 identified primary recreation opportunities. The SRMAs would maintain or enhance existing opportunities. Some existing uses without focused recreation management under the No Action Alternative would have designated management. These uses include OHV riding in the Deadman and Rosevear areas and the fishing and boating activities at Cedar Creek Reservoir, Little Pilgrim Gulch, and Salmon Falls Reservoir. Changes to recreation opportunity settings would be specific to individual SRMAs.

This alternative would manage 304,000 acres as four separate ERMAs (Canyonlands, Jarbidge Foothills, Luds Point, and Rosevear). This would be the only alternative to allocate ERMAs. These ERMAs would recognize existing recreation use, demand, and sustain recreation activities and associated qualities and conditions of the ERMA, commensurate with management of other resources and resource uses.

This alternative would provide for custodial recreational management of 1,047,000 acres as non-RMA lands. Impacts from this management are the same as described for Alternative I.

The impacts to the type, number, and setting of recreation opportunities resulting from SRP management would be the same as those described for Alternative I.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on recreation:

- Acres with priority recreation management focus (Special Recreation Management Areas [SRMAs]),
- Type of recreation opportunities, and
- Number of recreation opportunities.

Table 4-340 summarizes SRMAs by fire suppression areas by alternative from management for wildland fire ecology and management described in Chapter 2. Reducing or preventing fires would protect recreational settings and available opportunities. Temporary restrictions due to fire, fuels treatments, or emergency stabilization and burned area rehabilitation (ES&BAR) treatments could limit number and type of recreation opportunities. Wildland fire can temporarily remove or change the vegetation component of areas, affecting the physical setting.

Table 4-340. Special Recreation Management Areas in Fire Suppression Areas by Alternative (Acres)

SRMA	Suppression Area	Alternative					
		I	II	III	IV	V	VI
Balanced Rock	Conditional	0	0	0	0	0	0
	Critical	500	0	500	0		500
Canyonlands	Conditional	76,000	0	0	65,000	0	0
	Critical	73,000	0	0	84,000	0	0
Deadman/Yahoo	Conditional	32,000	0	32,000	32,000	0	0
	Critical	4,000	0	2,000	2,000	0	0
Jarbidge Foothills	Conditional	26,000	0	0	0	0	0
	Critical	107,000	0	0	0	0	0
Jarbidge Forks	Conditional	0	1,100	1,000	0	0	700
	Critical	2,000	900	1,000	2,000	2,000	1,300
Little Pilgrim	Conditional	0	100	100	0	0	100
	Critical	300	300	300	0	0	300
Salmon Falls Reservoir	Conditional	1,000	4,000	600	1,000	0	0
	Critical	4,000	1,000	4,400	4,000	0	1,000
Yahoo	Conditional	0	0	0	0	2,000	2,000
	Critical	0	0	0	0	1,000	1,000
Deadman	Conditional	0	0	0	0	0	7,000
	Critical	0	0	0	0	0	6,000
Conditional Total		**135,000**	**5,000**	**34,000**	**98,000**	**2,000**	**9,800**
Critical Total		**190,000**	**2,000**	**8,000**	**92,000**	**3,000**	**10,100**

[A] The No Action Alternative is not included in this table because the entire field office is managed for full suppression.

Impacts from Management Specific to the No Action Alternative

Identifying all areas for full suppression in the No Action Alternative does not result in the prioritization of any areas for fire suppression activities. As a result, SRMAs would be susceptible to changes in physical

setting due to wildland fire. Wildland fire management described for the No Action Alternative would not affect the type, number, or setting of recreation opportunities as the entire planning area would be managed for full suppression.

Impacts from Management Specific to Alternative I

The Canyonlands and Deadman/Yahoo SRMAs and the Cedar Creek Recreation Management Zone (RMZ) within the Salmon Falls Reservoir SRMA (109,000 acres) would be located primarily in conditional suppression areas in Alternative I. Conditional suppression areas would be more likely than critical suppression areas to experience a change in recreation opportunity setting due to the possibility of increased wildland fire severity. The SRMAs located in critical suppression areas (113,000 acres; Balanced Rock, Jarbidge Foothills, Jarbidge Forks, Little Pilgrim, and the remainder of Salmon Falls Reservoir) would be less susceptible to changes in physical settings (naturalness, vegetation component of the area, etc.). This impact would be of short duration (five years or less) depending on the pre-fire vegetation community; re-growth or rehabilitation of vegetation would allow the setting to recover.

Improving water availability for fire suppression in areas of high recreation use would help maintain the existing recreation opportunities and settings. Short-term closures of recreation areas and facilities could occur in areas with active fires to support suppression activities or in recently burned areas to support ES&BAR activities, temporarily affecting recreation opportunity type and number. Recreation opportunity setting would remain unchanged.

A fuel break located around an SRMA would protect the recreation opportunities and settings from a fire originating outside the SRMA. Fuel breaks would minimize the potential for change to recreation settings. This would have no effect on recreation opportunity type and number.

Impacts from Management Specific to Alternative II

The Salmon Falls Reservoir SRMA would be located primarily in conditional suppression areas identified for Alternative II. This area would be more susceptible to temporary changes in physical setting due to wildland fire as described in Alternative I. The SRMAs primarily located in critical suppression areas (Jarbidge Forks and Little Pilgrim) would be less susceptible to changes in physical setting.

Impacts from Management Specific to Alternative III

The Deadman/Yahoo SRMA and the Cedar Creek RMZ within the Salmon Falls Reservoir SRMA would be located primarily in conditional suppression areas (32,600 acres). These areas would be more susceptible to temporary changes in physical setting due to wildland fire as described for Alternative I than SRMAs primarily located in critical suppression areas (6,200 acres); Balanced Rock, Jarbidge Forks, Little Pilgrim, and the remainder of Salmon Falls Reservoir.

Short-term closures of recreation areas and facilities would occur in areas with active fires to support suppression activities or in recently burned areas to support ES&BAR activities, temporarily reducing recreation opportunity type and number.

Impacts from Management Specific to Alternative IV

The Deadman/Yahoo SRMAs and the Cedar Creek RMZ within the Salmon Falls SRMA would be located primarily in conditional suppression areas (33,000 acres). These areas would be more susceptible to temporary changes in physical setting due to wildland fire as described for Alternative I than SRMAs primarily located in critical suppression areas (90,000 acres); Canyonlands, Jarbidge Forks, and the remainder of Salmon Falls Reservoir.

Short-term closures of recreation areas and facilities would occur in areas with active fires to support suppression activities or in recently burned areas to support ES&BAR activities, temporarily reducing recreation opportunity type and number.

Impacts from Management Specific to Alternative V

The Yahoo SRMA would be located primarily in a conditional suppression area (2,000 acres). This area would be more susceptible to temporary changes in physical setting due to wildland fire as described for Alternative I than the Jarbidge Forks SRMA primarily located in a critical suppression area (2,000 acres).

Short-term closures of recreation areas and facilities would occur in areas with active fires to support suppression activities or in recently burned areas to support ES&BAR activities, temporarily reducing recreation opportunity type and number.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The Yahoo and Deadman SRMAs would be located primarily in a conditional suppression area (9,000 acres). These areas would be more susceptible to temporary changes in physical setting due to wildland fire as described for Alternative I than SRMAs primarily located in critical suppression areas (3,100 acres); Balanced Rock, Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir.

Short-term closures of recreation areas and facilities would occur in areas with active fires to support suppression activities or in recently burned areas to support ES&BAR activities, temporarily reducing recreation opportunity type and number.

Impacts from Lands with Wilderness Characteristics Actions

Managing Lands with Wilderness Characteristics for their undeveloped character and to provide opportunities for unconfined recreation activities and solitude would maintain related recreation opportunities such as primitive camping and hiking.

The following indicators were used to analyze the impacts of Lands with Wilderness Characteristics actions on recreation:

- Type of recreation opportunities,
- Number of recreation opportunities, and
- Recreation opportunity setting.

Impacts from Management Specific to the No Action Alternative and Alternatives II, III, and VI (Proposed RMP)

These alternatives would not maintain wilderness characteristics on lands outside wilderness and the Wilderness Study Area (WSA). Alterations to the existing wilderness character (i.e., naturalness, opportunity for solitude, or opportunity for primitive and/or unconfined recreation) would change the recreation opportunity type, number, and setting within those areas.

Impacts from Management Specific to Alternative I

Actions proposed in Alternative I would maintain wilderness characteristics on 52,000 acres outside wilderness and the WSA. Alternative I would maintain the existing backcountry and/or primitive recreation opportunity type, number, and setting within those areas.

Impacts from Management Specific to Alternative IV

Actions proposed in Alternative IV would maintain wilderness characteristics on 37,000 acres outside wilderness and the WSA. Alternative IV would maintain the existing backcountry and/or primitive recreation opportunity type, number, and setting within those areas.

Impacts from Management Specific to Alternative V

Actions proposed in Alternative V would maintain wilderness characteristics on 104,000 acres outside the wilderness and the WSA. Alternative V would maintain the existing backcountry and/or primitive recreation opportunity type, number, and setting within those areas.

Impacts from Transportation and Travel Actions

Transportation and travel management may redistribute or modify some types of recreation activities by changing the amount and type of access. The areas allocated as open to motorized vehicle use, limited to designated routes, or closed to motorized vehicle use may affect recreation opportunity type and setting. Further analysis related to recreation type, number, and setting opportunities and transportation and travel management will be conducted during the subsequent travel planning process.

The indicators used to analyze the impacts from Transportation and Travel actions to recreation are:

- Type of recreation opportunities,
- Number of recreation opportunities, and
- Recreation opportunity setting.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, existing management would continue to allow cross-country motorized vehicle use in designated areas (25% of the planning area), providing the largest portion of land available for this recreation opportunity among the alternatives. This may diminish the setting for some non-motorized recreation opportunities such as primitive camping, hiking, horseback riding, and some types of hunting, fishing, and wildlife viewing, due to potential for disturbances related to motorized recreation. The type, and number of recreation opportunities would remain unchanged. The closure of motorized vehicle travel in the Salmon Falls Creek Area of Critical Environmental Concern (ACEC) would continue; this would not affect recreation type, number, or setting in this area as it is accessible only through non-motorized means.

Impacts from Management Common to All Action Alternatives

All types of recreation opportunities would be a consideration for route designation, restrictions, or modification. Route designation would define the allowable routes for travel and access and would affect the type, number, and setting of opportunities (i.e., motorized, non-motorized).

Impacts from Management Specific to Alternative I

Alternative I would allow cross-country motorized vehicle use in designated areas (less than 1% of the planning area). While this would reduce the amount of land available for this recreation opportunity, a portion of area currently utilized for cross-country motorized vehicle use would be retained for this use. Recreation opportunity type and number would not change, as these activities would still be allowed.

Reducing the number of acres open to cross-country motorized vehicle use would improve physical settings by protecting resources and provide for larger areas for non-motorized recreation opportunities. The social setting would be expected to change, as cross-country motorized users would be limited to defined areas, increasing their contact occurrences. While the existing closure in the Salmon Falls Creek ACEC would continue, Alternative I would also include closures in some Lands with Wilderness Characteristics. Some of these areas have existing primitive routes within them, and these closures may change the type of recreation opportunities by eliminating motorized use within those areas (e. g. off-highway vehicle [OHV] riding and 4X4 driving).

Allowing cross-country motorized travel to campsites within 25 feet of designated routes would not affect recreation opportunity type, number, or setting. Restricting motorized game retrieval to within 300 feet of a designated route would minimize damage to natural resources and could subsequently enhance recreation opportunity settings.

Impacts from Management Specific to Alternative II

Alternative II would not allow cross-country motorized vehicle use anywhere within the planning area. This would close all land available for this recreation opportunity. Recreation opportunity type and number would change, as these activities would no longer be allowed.

Elimination of all open areas would improve physical settings by protecting resources and provide for larger areas for non-motorized recreation opportunities.

Allowing cross-country motorized travel to campsites within 100 feet of designated routes would not affect recreation opportunity type, number, or setting. Allowing motorized game retrieval off any designated route could damage natural resources and subsequently diminish recreation opportunity settings.

Impacts from Management Specific to Alternative III

Alternative III would allow cross-country motorized vehicle use in designated areas (less than 1% of the planning area). While this would reduce the amount of land available for this opportunity, a portion of area currently utilized for cross-country travel would be retained for this use. Recreation opportunity type and number would not change, as these activities would still be allowed.

Similar to Alternative I, reducing the number of acres open to cross-country motorized vehicle use would improve physical settings by protecting resources and provide for larger areas for non-motorized recreation opportunities. The social setting would be expected to change, as cross-country motorized users would be limited to defined areas, increasing their contact occurrences.

Allowing cross-country travel to campsites within 25 feet of designated routes would not affect recreation opportunity type, number, or setting. Not allowing motorized game retrieval off designated routes would minimize damage to natural resources and could subsequently enhance recreation opportunity settings.

Impacts from Management Specific to Alternative IV

Alternative IV would allow cross-country motorized vehicle use in designated areas (less than 1% of the planning area). While this alternative would reduce the amount of land available for this opportunity, a portion of area currently utilized for cross-country travel would be retained for this use. Recreation opportunity type and number would not change, as these activities would still be allowed.

Similar to Alternative I, reducing the number of acres open to cross-country motorized vehicle use would improve physical settings by protecting resources and provide larger areas for non-motorized recreation opportunities. The social setting would also be expected to change, as cross-country motorized users would be limited to defined areas, increasing their contact occurrences. Alternative IV would also include closures in Lands with Wilderness Characteristics. Some of these areas have existing primitive routes within them, and these closures would change the type of recreation opportunities by eliminating motorized use within those areas (e.g. OHV riding and 4X4 driving).

Allowing cross-country travel to campsites within 25 feet of designated routes would not affect recreation opportunity type, number, or setting. Not allowing motorized game retrieval off designated routes would minimize damage to natural resources and could subsequently enhance recreation opportunity settings.

Impacts from Management Specific to Alternative V

Alternative V would allow cross-country motorized vehicle use in designated areas (less than 1% of the planning area). This alternative would have the smallest area available for this opportunity; however, a portion of area currently utilized for cross-country motorized vehicle use would be retained. Recreation opportunity type and number would not change, as these activities would still be allowed.

Similar to Alternative I, reducing the number of acres open to cross-country motorized vehicle use would improve physical settings by protecting resources and provide larger areas for non-motorized recreation opportunities. The social setting would change, as cross-country motorized users would be limited to defined areas, increasing their contact occurrences. Alternative V would also close Lands with Wilderness Characteristics (104,000 acres) to motorized vehicle use. Some of these areas have existing primitive routes within them, and these closures would change the type of recreation opportunities by eliminating motorized use within those areas (e.g. OHV riding and 4X4 driving).

Allowing cross-country travel to campsites within 25 feet of designated routes would not change recreation opportunity type, number, or setting. Not allowing motorized game retrieval off designated routes would minimize damage to natural resources and could subsequently enhance recreation opportunity settings.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would allow cross-country motorized vehicle use in designated areas (less than 1% of the planning area). While this alternative would reduce the amount of land available for this recreation opportunity, a portion of area currently utilized for cross-country motorized vehicle use would be retained for this use. Recreation opportunity type and number would not change, as these activities would still be allowed.

Similar to Alternative I, reducing the number of acres open to cross-country motorized vehicle use would improve physical settings by protecting resources and provide larger areas for non-motorized recreation opportunities. The social setting would change, as cross-country motorized users would be limited to defined areas, increasing their contact occurrences.

Allowing cross-country motorized travel to campsites within 100 feet of designated routes would not affect recreation opportunity type, number, or setting. Not allowing motorized game retrieval off designated routes would minimize damage to natural resources and could subsequently enhance recreation opportunity settings.

Impacts from Land Use Authorizations Actions

Land use authorizations have the potential to affect the setting of recreation opportunities. Development and ancillary structures associated with wind energy development and other rights-of-way (ROWs) would displace recreational visitors or limit some available opportunities. The actual impact would be relative to the extent of development within available areas.

The following indicators were used to analyze the impacts of Land Use Authorizations actions on recreation:

- Type of recreation opportunities,
- Number of recreation opportunities, and
- Recreation opportunity setting.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 30,000 acres would be within utility ROW corridors, and 111,000 acres within expected wind energy development areas, primarily in the northeast and southeast portions of the planning area. Recreation opportunities such as natural scenery viewing would be adversely impacted, and settings for other opportunities such as primitive camping or hiking would be changed from the existing situation. The visual and natural components of recreation physical settings would be most affected by these actions relative to the extent and location of development; for example, primitive recreation in the Jarbidge Foothills may be adversely impacted due to a change in naturalness.

Impacts from Management Specific to Alternative I

Under Alternative I, 53,000 acres would be within utility ROW corridors, and 39,000 acres within expected wind energy development areas, primarily in the northeast portion of the planning area. Recreation opportunities such as natural scenery viewing would be adversely impacted, and settings for other opportunities such as primitive camping or hiking would be changed from the existing situation. The visual and natural components of recreation physical settings would be most affected by these actions relative to the extent and location of development. For example, viewing natural scenery and pleasure driving may be adversely impacted in the area due to a change in visual quality.

Impacts from Management Specific to Alternative II

Under Alternative II, 53,000 acres would be within utility ROW corridors, and 127,000 acres within expected wind energy development areas, primarily in the northeast and southeast portions of the planning area. The impacts on these acres would be the same as described for the No Action Alternative.

Impacts from Management Specific to Alternative III

Under Alternative III, 53,000 acres would be within utility ROW corridors, and 50,000 acres within expected wind energy development areas, primarily in the northeast portion of the planning area. The impacts of these acres would be the same as described for Alternative I.

Impacts from Management Specific to Alternative IV

Under Alternative IV, 53,000 acres would be within utility ROW corridors, and 37,000 acres within expected wind energy development areas, primarily in the northeast portion of the planning area. The impacts of these acres would be the same as described for Alternative I.

Impacts from Management Specific to Alternative V

Under Alternative V, 53,000 acres would be within utility ROW corridors, and 31,000 acres within expected wind energy development areas, primarily in the northeast portion of the planning area. The impacts of these acres would be the same as described for Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, 43,000 acres would be within utility ROW corridors, and 22,000 acres within expected wind energy development areas, primarily in the northeast portion of the planning area. The impacts of these acres would be the same as described for Alternative I.

Impacts from Areas of Critical Environmental Concern Actions

Areas of Critical Environmental Concern (ACECs) are designated and managed to protect the identified relevant and important values. Management may prescribe measures to mitigate impacts from certain activities within the ACEC boundaries, which may affect recreation opportunities in those areas. Impacts to recreation are characterized by assessing changes in recreation opportunities, activities, and experiences. Because recreators participate in a diverse set of activities for a variety of reasons, specific management actions may simultaneously adversely and beneficially impact recreation opportunities depending on an individual's desired experience. Changes are compared to the existing situation using terms such as "change" and "no change". Table 4-341 summarizes the impacts to recreation indicators from ACEC management described in Chapter 2.

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on recreation:

- Type of recreation opportunities,
- Number of recreation opportunities, and
- Recreation opportunity setting.

Table 4-341. Impacts to Recreation from Areas of Critical Environmental Concern by Alternative

Indicator	Alternative						
	No Action	I	II	III	IV	V	VI
Type of recreation opportunities	No change	Change	No change	Change	Change	Change	Change
Number of recreation opportunities	No change	Change	No change	Change	Change	Change	Change
Recreation opportunity setting	No change	Change	No change	No change	No change	Change	No change

Impacts from Management Specific to the No Action Alternative

Managing ACECs to protect or enhance the relevant and important values and addressing off-highway vehicle riding on a case-by-case basis would not adversely affect the type, number, and setting of recreation opportunities within ACECs.

Impacts from Management Specific to Alternative I

In Alternative I, management specific to the Bruneau-Jarbidge, Lower Bruneau Canyon, Middle Snake, Salmon Falls Creek, and Sand Point ACECs includes protective measures (e.g., permit systems, designated campsites outside ACEC, road improvements, travel barriers, toilets) to alter recreation uses if they are impairing relevant and important values. Protective measures for this purpose may change opportunity type, number, and setting within those ACECs. Restrictions may include seasonal or spatial closures and modifications such as toilets or travel barriers that alter the evidence of use or naturalness of the setting. Special Recreation Permits (SRPs) would be allowed within ACECs as long as the relevant and important values are protected, which may beneficially increase the number of recreation opportunities available.

Impacts from Management Specific to Alternative II

Under Alternative II, no ACECs would be designated, and no management specific to recreation is prescribed. Alternative II would not adversely affect the type, number, or setting of recreation opportunities.

Impacts from Management Specific to Alternative III

In Alternative III, management specific to the Reduced Bruneau-Jarbidge, Salmon Falls Creek, and Sand Point ACECs would implement protective measures (e.g., permit systems, designated campsites outside ACEC) to alter recreation uses if they are impairing relevant and important values. Restrictions for this purpose may adversely decrease opportunity type and number within those ACECs. SRPs would be allowed within ACECs as long as the relevant and important values are protected, which may beneficially increase the number of opportunities available. This would not affect the setting of recreation opportunities.

Impacts from Management Specific to Alternative IV

In Alternative IV, management specific to the Expanded Bruneau-Jarbidge, Inside Desert, Jarbidge Foothills, Lower Bruneau Canyon, and Sand Point ACECs would implement protective measures (e.g., permit systems, designated campsites outside ACEC boundaries) to alter recreation uses if they are impairing relevant and important values. Restrictions for this purpose may adversely decrease opportunity type and number within those ACECs. SRPs would be allowed within ACECs as long as the relevant and important values are protected, which may beneficially increase the number of opportunities available. This would not affect the setting of recreation opportunities.

Impacts from Management Specific to Alternative V

In Alternative V, management specific to the Lower Bruneau Canyon, Middle Snake, Sagebrush Sea, and Sand Point ACECs would implement protective measures (e.g., permit systems, designated campsites within the ACEC, road improvements, travel barriers, toilets) that may adversely affect recreation uses if they are impairing relevant and important values. Restrictions or modifications for this purpose may change opportunity type, number, and setting within those areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, management specific to the Lower Bruneau Canyon, Salmon Falls Creek, Sand Point, and Upper Bruneau Canyon ACECs would implement protective measures (e.g., designated campsites outside ACEC, road improvements, travel barriers,) to alter recreation uses if they are impairing relevant and important values. Restrictions or modifications for this purpose may change opportunity type, number, and setting within those ACECs. Restrictions may include seasonal or spatial closures, and modifications such as travel barriers may alter the evidence of use or naturalness of the setting. SRPs would be allowed within ACECs as long as the relevant and important values are protected, which may beneficially increase the number of opportunities available.

Summary of Direct and Indirect Impacts

The acreage designated for Special Recreation Management Areas (SRMAs) varies across alternatives. Alternative I would allocate the largest acreage for special recreation management, followed by Alternative IV, the No Action Alternative, and Alternatives III, VI, II, and V. Acres not designated as SRMA

would be managed as Extensive Recreation Management Areas (ERMAs) or lands not designated as Recreation Management Areas.

The types of recreation opportunities available would be affected by various management actions throughout all of the alternatives. Primary activities displayed in Table 4-329 represent recreation opportunities identified in the SRMA matrices (Appendix H). Other types of recreation opportunities may exist in SRMAs and ERMAs, but are not distinctly identified. The types of available opportunities would mostly be affected by two factors: the acres with focused recreation management and acres designated for cross-country motorized vehicle use. Preferred types of opportunities are unique to each recreator, and a loss or restriction of one type may create or expand a different type. A relative comparison of types of available opportunities across alternatives is represented by the number of activities identified for the SRMAs. Therefore, Alternative I offers the highest number of opportunities (17), followed by Alternatives III (15), IV (14), VI (12), the No Action Alternative (11), II (10), and V (5).

Recreation opportunity setting considers physical, social, and administrative factors. SRMAs have prescribed setting character to maintain or enhance recreation opportunities and experiences. ERMAs also have a variety of setting character, but the setting character must be commensurate with the management of other resources and resource uses. Impacts to settings are represented by the difference in SRMA designations across alternatives and the anticipated change to opportunities.

The tables below summarize the impacts to recreation by alternative. Where the impacts are quantifiable, such as changes in SRMA acres, it is described as an “increase”, “decrease”, or “no change.” Impacts that are mostly qualitative, such as changes to opportunity settings, are displayed in these summary tables only as “change” or “no change.”

Impacts from the No Action Alternative

The No Action Alternative would continue to manage 86,000 acres as five separate SRMAs. The SRMAs have not been clearly delineated or mapped, but acreage has been referenced in the allocations. Managing the SRMAs without clearly established boundaries does not address the existing or anticipated increase in demand of the recreational resources.

Recreation opportunity type, number, and settings may vary to accommodate resources and resource uses. Currently, there are portions of the planning area receiving high levels of recreation use not included in these SRMAs. Without focused recreation management for these areas, opportunity settings may change due to alterations to natural resources. Absence of management to protect Lands with Wilderness Characteristics would allow activities to occur that may degrade the wilderness character in those areas which would limit opportunities for solitude or primitive, unconfined recreation. Allowing 25% of the planning area to remain open to cross-country motorized vehicle use would provide an opportunity for this type of recreational use, but would also limit non-motorized recreation opportunities and settings. Wind energy developments and utility right-of-way (ROW) corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential for these projects under the No Action Alternative is 202,000 acres. Table 4-342 summarizes the impacts to recreation from the No Action Alternative.

Table 4-342. Summary of Impacts to Recreation under the No Action Alternative

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	No change	No change	No change	Change
Wildland Fire Ecology and Management	No change	No change	No change	No change
Lands with Wilderness Characteristics	No change	Change	Change	Change

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Transportation and Travel	No change	No change	No change	Change
Land Use Authorizations	No change	Change	Change	Change
Areas of Critical Environmental Concern (ACECs)	No change	No change	No change	No change

Overall, the No Action Alternative would result in a minor beneficial increase in recreational opportunities in the long term and no change in acres of focused management.

Impacts from Alternative I

Alternative I would designate 326,000 acres as seven separate SRMAs. This would be an increase in SRMA acreage over the No Action Alternative and would be the largest SRMA acreage designated among the action alternatives with a total of 17 identified primary recreation opportunities.

Designation of these SRMAs would provide the broadest range of activity type among all alternatives. Wildland fire ecology and management actions would place restrictions or closures on recreation areas and activities during fire suppression or rehabilitation activities. This would temporarily affect the type and number of available recreation opportunities. This alternative would also provide for fuel breaks around SRMAs. Management to protect some Lands with Wilderness Characteristics would not allow activities to occur that may degrade the wilderness character in those areas, protecting opportunities for solitude or primitive, unconfined recreation in those areas. A substantial decrease in the acres open to cross-country motorized vehicle use would decrease the opportunity for this type of recreational use, but may also enhance recreation settings and opportunities for other types of recreational use. Consideration of specific recreation activities as criteria for route designation would affect the type, number, and setting of recreation opportunities by allowing or restricting motorized access to specific destinations. Wind energy developments and utility ROW corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential for these projects under Alternative I is 130,000 acres. ACEC management would implement protective measures to alter recreation uses that are impairing relevant and important values, affecting type, number, and settings of recreation opportunities. Table 4-343 summarizes the impacts to recreation from Alternative I.

Table 4-343. Summary of Impacts to Recreation under Alternative I

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	Increase	Change	Change	Change
Wildland Fire Ecology and Management	No change	Change	Change	No change
Lands with Wilderness Characteristics	No change	No change	No change	No change
Transportation and Travel	No change	Change	Change	Change
Land Use Authorizations	No change	Change	Change	Change
ACECs	No change	Change	Change	Change

Overall, Alternative I would result in a major beneficial increase in recreational opportunities in the long term and an increase in acres of focused management.

Impacts from Alternative II

Alternative II would designate 7,000 acres as three separate SRMAs. This would be the second lowest SRMA acreage designated among the alternatives, with 10 identified primary recreation opportunities.

The SRMAs would maintain or enhance some existing opportunities, while minimizing conflict with resource uses. There would be no SRMAs managed for motorized recreation use. Wildland fire ecology and management actions would place restrictions or closures on recreation areas and activities during fire suppression or rehabilitation activities. This would temporarily affect the type and number of available recreation opportunities. Absence of management to protect Lands with Wilderness Characteristics would allow activities to occur that may degrade the wilderness character in those areas, limiting opportunities for solitude or primitive, unconfined recreation. The lack of areas open to cross-country motorized vehicle use would eliminate the opportunity for this type of recreational use, but may also enhance recreation settings and opportunities for other types of recreational use; however, cross-country motorized use may continue if Recreation and Public Purposes Act leases were pursued. Consideration of specific recreation activities as criteria for route designation would affect the type, number, and setting of recreation opportunities by allowing or restricting motorized access to specific destinations. Wind energy developments and utility ROW corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential to be developed for these projects under Alternative II is 276,000 acres, the highest acreage of all alternatives. Table 4-344 summarizes the impacts to recreation from Alternative II.

Table 4-344. Summary of Impacts to Recreation under Alternative II

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	Decrease	Change	Change	Change
Wildland Fire Ecology and Management	No change	Change	Change	No change
Lands with Wilderness Characteristics	No change	Change	Change	Change
Transportation and Travel	No change	Change	Change	Change
Land Use Authorizations	No change	Change	Change	Change
ACECs	No change	No change	No change	No change

Overall, Alternative II would result in a minor adverse decrease in recreational opportunities in the long term and a decrease in acres of focused management.

Impacts from Alternative III

Alternative III would designate 42,000 acres as five separate SRMAs. This would be a decrease in SRMA acreage from the No Action Alternative and would be the third lowest SRMA acreage designated among the alternatives, with 15 identified primary recreation opportunities.

The SRMAs would maintain or enhance existing opportunities. Wildland fire ecology and management actions would place restrictions or closures on recreation areas and activities during fire suppression or rehabilitation activities. This would temporarily affect the type and number of available recreation opportunities. Absence of management to protect Lands with Wilderness Characteristics would allow activities to occur that may degrade the wilderness character in those areas, limiting opportunities for solitude or primitive, unconfined recreation. A substantial decrease in the acres open to cross-country motorized vehicle use would decrease the opportunity for this type of recreational use, but may also enhance recreation settings and opportunities for other types of recreational use. Consideration of specific recreation activities as criteria for route designation would affect the type, number, and setting of recreation opportunities by allowing or restricting motorized access to specific destinations. Wind energy developments and utility ROW corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential to be developed for these projects under Alternative III is 141,000 acres. ACEC management would implement protective measures to alter recreation uses that are impairing relevant and important values, affecting type and number of recreation opportunities. Table 4-345 summarizes the impacts to recreation from Alternative III.

Table 4-345. Summary of Impacts to Recreation under Alternative III

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	Decrease	Change	Change	Change
Wildland Fire Ecology and Management	No change	Change	Change	No change
Lands with Wilderness Characteristics	No change	Change	Change	Change
Transportation and Travel	No change	Change	Change	Change
Land Use Authorizations	No change	Change	Change	Change
ACECs	No change	Change	Change	No change

Overall, Alternative III would result in a major beneficial increase in recreational opportunities in the long term and a decrease in acres of focused management.

Impacts from Alternative IV

Alternative IV would designate 190,000 acres as four separate SRMAs. This would be an increase in SRMA acreage over the No Action Alternative, and the second highest SRMA acreage designated among the alternatives, with 14 identified primary recreation opportunities.

The SRMAs would maintain existing opportunities. Wildland fire ecology and management actions would place restrictions or closures on recreation areas and activities during fire suppression or rehabilitation activities. This would temporarily affect the type and number of available recreation opportunities. A substantial decrease in the acres open to cross-country motorized vehicle use would decrease the opportunity for this type of recreational use, but may also enhance recreation settings and opportunities for other types of recreational use. Consideration of specific recreation activities as criteria for route designation would affect the type, number, and setting of recreation opportunities by allowing or restricting motorized access to specific destinations. Wind energy developments and utility ROW corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential to be developed for these projects under Alternative IV is 128,000 acres. ACEC management would implement protective measures to alter recreation uses that are impairing relevant and important values, affecting type and number of recreation opportunities. Table 4-346 summarizes the impacts to recreation from Alternative IV.

Table 4-346. Summary of Impacts to Recreation under Alternative IV

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	Increase	Change	Change	Change
Wildland Fire Ecology and Management	No change	Change	Change	No change
Lands with Wilderness Characteristics	No change	No change	No change	No change
Transportation and Travel	No change	Change	Change	Change
Land Use Authorizations	No change	Change	Change	Change
ACECs	No change	Change	Change	No change

Overall, Alternative IV would result in a moderate beneficial increase in recreational opportunities in the long term and an increase in acres of focused management.

Impacts from Alternative V

Alternative V would designate 5,000 acres as two separate SRMAs. This would be a decrease in SRMA acreage from the No Action Alternative, and the lowest SRMA acreage designated among the action alternatives, with five identified primary recreation opportunities.

The SRMAs would maintain portions of existing opportunities, while allowing for restoration of resources. This alternative would not provide designated management for some of the existing uses, such as off-highway vehicle riding in the Deadman and Rosevear areas and the fishing and boating activities at Little Pilgrim Gulch, Cedar Creek Reservoir and Salmon Falls Reservoir. Wildland fire ecology and management actions would place restrictions or closures on recreation areas and activities during fire suppression or rehabilitation activities. This would temporarily affect the type and number of available recreation opportunities. A substantial decrease in the acres open to cross-country motorized vehicle use would decrease the opportunity for this type of recreational use, but may also enhance recreation settings and opportunities for other types of recreational use. Consideration of specific recreation activities as criteria for route designation would affect the type, number, and setting of recreation opportunities by allowing or restricting motorized access to specific destinations. Wind energy developments and utility ROW corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential to be developed for these projects under Alternative V is 126, 000 acres. ACEC management would implement protective measures to alter recreation uses that are impairing relevant and important values, affecting type, number, and settings of recreation opportunities. Table 4-347summarizes the impacts to recreation from Alternative V.

Overall, Alternative V would result in a moderate adverse decrease in recreational opportunities in the long term and a decrease in acres of focused management.

Table 4-347. Summary of Impacts to Recreation under Alternative V

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	Decrease	Change	Change	Change
Wildland Fire Ecology and Management	No change	Change	Change	No change
Lands with Wilderness Characteristics	No change	No change	No change	No change
Transportation and Travel	No change	Change	Change	Change
Land Use Authorizations	No change	Change	Change	Change
ACECs	No change	Change	Change	Change

Impacts from Alternative VI (Proposed RMP)

Alternative VI would designate 20,000 acres as six separate SRMAs. This would be a decrease in SRMA acreage from the No Action Alternative. Alternative VI would have the fifth lowest SRMA acreage designated among the alternatives, with 12 identified primary recreation opportunities. This alternative would be the only alternative designating ERMAs (304,000 acres), which would sustain the principle recreation activities, commensurate with management of other resources and resource uses, for these areas.

The SRMAs would maintain or enhance existing recreation opportunities. Wildland fire ecology and management actions would place restrictions or closures on recreation areas and activities during fire suppression or rehabilitation activities. This would temporarily affect the type and number of available recreation opportunities. Absence of management to protect Lands with Wilderness Characteristics would allow activities to occur that may degrade the wilderness character in those areas, limiting opportunities for solitude or primitive, unconfined recreation. A substantial decrease in the acres open to cross-country motorized vehicle use would decrease the opportunity for this type of recreational use, but may also enhance recreation settings and opportunities for other types of recreational use. Consideration of

specific recreation activities as criteria for route designation would affect the type, number, and setting of recreation opportunities by allowing or restricting motorized access to specific destinations. Wind energy developments and utility ROW corridors would limit the type and number of recreation opportunities by altering the visual setting. The total area with potential to be developed for these projects is 120, 000 acres. ACEC management would implement protective measures to alter recreation uses that are impairing relevant and important values, affecting type and number of recreation opportunities. Table 4-348 summarizes the impacts to recreation from Alternative VI.

Table 4-348. Summary of Impacts to Recreation under Alternative VI (Proposed RMP)

Section	Acres of Focused Recreation Management	Type of Recreation Opportunities	Number of Recreation Opportunities	Recreation Opportunity Setting
Recreation	Increase	Change	Change	Change
Wildland Fire Ecology and Management	No change	Change	Change	No change
Lands with Wilderness Characteristics	No change	Change	Change	Change
Transportation and Travel	No change	Change	Change	Change
Land Use Authorizations	No change	Change	Change	Change
ACECs	No change	Change	Change	No change

Overall, Alternative VI would result in a moderate beneficial increase in recreational opportunities in the long term and an increase in acres of focused management.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

Cumulative impacts on recreation include other past, present, and reasonably foreseeable actions that may affect recreation associated with the planning area. The cumulative impact analysis area includes all lands within and around the planning area with similar recreation opportunities and within reasonable commuting distances (one to two hours) to pursue such recreation activities and experiences, such as portions of the Wells, Bruneau, Shoshone, Four Rivers, and Burley Field Offices, the Jarbidge Ranger District and Jarbidge Wilderness of the Humboldt-Toiyabe National Forest, and the Minidoka Ranger District of the Sawtooth National Forest.

Past, present, and reasonably foreseeable actions for the following resource uses cumulatively affect recreation:

- Recreation,
- Transportation and Travel, and
- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

The Special Recreation Management Areas (SRMAs) in the No Action Alternative would not address the expected increase in regional demand and new recreation technology that is expected to occur over the life of the plan. The combination of the allowable area for cross-country motorized vehicle use and continued motorized recreation expansion into areas not currently or historically used would result in changes to the existing recreational setting where these activities occur. Areas of concentrated use, such as the popular Deadman and Rosevear off-highway vehicle areas and Little Pilgrim and Salmon Falls

Reservoir for fishing and camping, would continue to see degradation of natural resources altering the recreational settings, and an increase in conflicts with other users and adjacent private landowners.

The transportation and travel management actions specific to the No Action Alternative would allow cross-country motorized travel on 25% of the planning area. This allowable use, in combination with increased travel restriction and demand throughout the region, would be expected to result in an increased participation in cross-country recreation in this area. This would result in an increase in resource, resources use, and other recreation use conflicts. Damage to vegetation, increased soil erosion, and habitat fragmentation would contribute to a change in recreational settings for non-motorized opportunities such as hiking, hunting, and wildlife viewing.

The No Action Alternative would designate a large portion of the planning area as available for wind energy development and transmission line projects, rights-of-way (ROWs), and other land use authorizations. In combination with proposed energy projects, this would change recreational settings and opportunities available on public lands in a substantial portion of the region. These developments may include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values, associated with certain recreation activities.

Cumulative Impacts from Alternative I

The SRMAs designated in Alternative I would accommodate the expected increase in regional demand and foreseeable new recreation technology that is expected to occur over the life of the plan. This increased recreation demand, combined with the prescribed individual SRMA management, would maintain or enhance recreation settings as needed for resources and resource use requirements.

The transportation and travel management specific to Alternative I would allow cross-country motorized travel on less than 1% of the planning area. This reduction in available area, in combination with increased travel restriction and demand throughout the cumulative impact analysis area, would be expected to result in an overall decrease in lands available for this activity. This would also result in a decrease in motorized recreation conflicts with resource, resources use, and other recreation uses. This would reduce damage to vegetation, soil erosion, and habitat fragmentation contributing to stability and enhancement of recreational settings for non-motorized opportunities such as hiking, hunting, and wildlife.

Under Alternative I, the portion of the planning area available for wind energy development and transmission projects, ROWs, and other land use authorizations in combination with proposed energy projects would change recreational settings and opportunities available on public lands in a smaller area than the No Action Alternative. These developments may include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values, associated with certain recreation activities.

Cumulative Impacts from Alternative II

The SRMAs designated in Alternative II would accommodate some existing uses, but would not address motorized recreation in the current use areas or accommodate the expected increased demand of all recreation. These SRMAs would not be sufficient to meet the demands of increased regional recreational use resulting in diminished recreation opportunity type, number and settings.

The transportation and travel management actions specific to Alternative II would eliminate cross-country motorized travel. This reduction in available area, in combination with increased travel restriction and demand throughout the cumulative impact analysis area, would be expected to result in an overall decrease in lands available for this activity. This would also result in a decrease in motorized recreation conflicts with resource, resources use, and other recreation uses. This would reduce damage to vegetation, soil erosion, and habitat fragmentation contributing to stability and enhancement of recreational settings for non-motorized opportunities such as hiking, hunting, and wildlife viewing.

Similar to the No Action Alternative, Alternative II would designate a large portion of the planning area as available for wind energy development and transmission projects, ROWs, and other land use authorizations. In combination with proposed energy projects, this would change recreational settings and opportunities available on public lands in a substantial portion of the region. These developments may

include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values, associated with certain recreation activities.

Cumulative Impacts from Alternative III

The SRMAs designated in Alternative III would accommodate the expected increase in regional demand and foreseeable new recreation technology that is expected to occur over the life of the plan. This increased recreation demand combined with the prescribed individual SRMA management would maintain or enhance recreation settings as needed for resource and resource use requirements.

The transportation and travel management actions specific to Alternative III would allow cross-country motorized travel on less than 1% of the planning area with cumulative impacts similar to Alternative I.

Under Alternative III, the portion of the planning area available for wind energy development and transmission projects, ROWs, and other land use authorizations in combination with proposed energy projects would change recreational settings and opportunities available on public lands in a smaller area than the No Action Alternative. These developments may include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values, associated with certain recreation activities.

Cumulative Impacts from Alternative IV

The SRMAs designated in Alternative IV would accommodate some of the expected increase in regional demand and new recreation technology. This alternative would not allocate the Little Pilgrim and Balanced Rock areas as SRMAs, which is not expected to have a cumulative impact on existing recreation opportunities for these areas.

The transportation and travel management action specific to Alternative IV would allow cross-country motorized travel on less than 1% of the planning area with cumulative impacts similar to Alternative I.

Under Alternative IV, the portion of the planning area available for energy production and transmission projects, ROWs, and other land use authorizations in combination with proposed energy projects would change recreational settings and opportunities available on public lands in a smaller area than the No Action Alternative. These developments may include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values associated with certain recreation activities.

Cumulative Impacts from Alternative V

Similar to the No Action Alternative, the SRMAs designated in Alternative V provide minimal focused management for recreation and would not accommodate the expected increase in regional demand and new recreation technology. An SRMA would be provided for motorized recreation, but would only comprise a portion of the area currently being used and would not be sufficient to accommodate increased regional demand. This alternative would provide for non-motorized recreation opportunity demand.

The transportation and travel management actions specific to Alternative V would allow cross-country motorized travel on less than 1% of the planning area with cumulative impacts similar to Alternative I.

Under Alternative V, the portion of the planning area available for energy production and transmission projects, ROWs, and other land use authorizations in combination with proposed energy projects would change recreational settings and opportunities available on public lands in a smaller area than the No Action Alternative. These developments may include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values, associated with certain recreation activities.

Cumulative Impacts from Alternative VI (Proposed RMP)

The SRMAs and Extensive Recreation Management Areas (ERMAs) designated in Alternative VI would accommodate some of the expected increase in regional demand and foreseeable new recreation technology that is expected to occur over the life of the plan. This increased recreation demand,

combined with the prescribed individual SRMA and ERMA management, would maintain or enhance recreation settings as needed for resource and resource use requirements.

The transportation and travel management actions specific to Alternative VI would allow cross-country motorized travel on less than 1% of the planning area with cumulative impacts similar to Alternatives I, III, and IV.

Under Alternative VI, the portion of the planning area available for energy production and transmission projects, ROWs, and other land use authorizations in combination with proposed energy projects would change recreational settings and opportunities available on public lands in a smaller area than the No Action Alternative and Alternative V. These developments may include substations, structures, transmission lines, new travel routes, and wind turbines, which would alter the natural and visual values, associated with certain recreation activities.

4.4.3. Transportation and Travel

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to transportation and travel:

- **Route density** – The linear length of routes per area (i.e., miles of route per square mile).
- **Route location** – The placement of the route relative to resources or resource uses. This includes alterations to alignment and grade.
- **Route condition** – Route condition is a result of the maintenance intensity applied to roads, primitive roads, and trails. Maintenance intensity provides guidance on the appropriate frequency and type of maintenance (e.g., gravel or pavement surfaces) that keeps routes in an acceptable condition.

Methods and Assumptions

The following sections within Chapter 2 analyzed the impacts to transportation and travel from management in detail: *Transportation and Travel*, *Fish*, *Wildlife*, *Special Status Species*, *Wildland Fire Ecology and Management, Recreation*, *Land Use Authorizations*, and *Areas of Critical Environmental Concern*. Impacts from management were not analyzed in the *Water Resources* and *Riparian Areas and Wetlands* sections because the impacts were captured in sections that were analyzed in detail. The remaining sections were not analyzed in detail because the management did not vary measurably between alternatives nor impact the indicators for transportation and travel. Impacts from management for transportation and travel can be found under *Impacts from Transportation and Travel Actions* in the *Air Quality, Soil Resources, Water Resources, Upland Vegetation, Riparian Areas and Wetlands, Fish, Wildlife, Special Status Plants, Special Status Fish and Aquatic Invertebrates, Special Status Wildlife, Noxious Weeds and Invasive Plants, Wildland Fire Ecology and Management, Wild Horses, Paleontological Resources, Cultural Resources, Lands with Wilderness Characteristics, Livestock Grazing, Recreation, Land Use Authorizations, Wilderness, Social Conditions,* and *Economic Conditions* sections.

Impact analyses and conclusions are based on BLM knowledge of resources in the planning area, review of existing literature, and information provided by other agencies. Effects are quantified where possible. In the absence of quantitative data, professional judgment was used. Impacts are described using ranges (e.g., route density – increase, decrease, or unchanged) of potential impacts or in qualitative terms, if appropriate.

The following assumptions were used when analyzing impacts to transportation and travel:

- Based on existing and historic trends and increases in population, motorized vehicle use would continue to increase within the planning area; however, the future rate of increase may be influenced by other factors (e.g., operating costs of vehicles, the cost of vehicles, etc.).

- The BLM would continue to recognize valid existing rights of access to State and private lands.
- The BLM would continue to authorize necessary access for leases, permits, or rights-of-way.
- Developments considered as components of range infrastructure do not include transportation routes unless specified.
- BLM objectives for management of motorized vehicle use are intended to protect resources, promote the safety of all users of those lands, and minimize conflicts among the various uses of those lands (BLM, 2001b).
- No new routes would be constructed in Lands with Wilderness Characteristics managed for those wilderness values.

Direct and Indirect Impacts

Impacts from Transportation and Travel Actions

All public lands are required to have motorized vehicle designations of open, limited, or closed to motorized vehicle use (43 CFR 8342.1). These designations determine where and how motorized vehicle use occurs. Open areas allow any type of vehicle, anywhere, anytime (commonly known as cross-country travel). Limited areas can restrict season of use, type of use, number of users, or limit use to designated or existing roads, trails, or ways. Motorized vehicle use is prohibited in closed areas.

The Omnibus Public Lands Management Act of 2009 (OPLMA; Public Law 111-11) directed the Secretary of Interior to prepare a Travel Management Plan (TMP) for motorized and mechanized off-highway vehicle (OHV) recreation on BLM-managed lands in Owyhee County. In general, the plan will limit recreational motorized and mechanized OHV use to a system of designated roads and trails; this limitation does not apply to snowmobiles. Until the RMP is complete and the subsequent Record of Decision is signed, which will initiate the travel management process for the planning area, all recreational motorized and mechanized OHV use (excluding snowmobiles) shall be limited to roads and trails in Owyhee County lawfully in existence on the day before the enactment of the Act.

Table 4-349 displays the number of acres open to cross-country motorized vehicle use, limited, closed to motorized vehicle use, or closed to motorized and mechanized travel by alternative.

Table 4-349. Travel Designations by Alternative (Acres)

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Open to Cross-Country Motorized Vehicle Use	342,000	4,000	0	4,000	4,000	1,000	4,000
Limited to Designated Routes (all motor vehicles including over-snow vehicles)	0	425,000	445,000	440,000	405,000	392,000	440,000
Limited (designated routes or seasonal restrictions)	215,000	0	0	0	0	0	0
Limited to Designated Routes (all motorized and mechanized recreational OHV (excluding snowmobiles)	751,000	828,000	864,000	864,000	864,000	812,000	864,000
Closed to Motorized Vehicle Use	3,000	54,000	2,000	3,000	38,000	106,000	3,000
Closed to Motorized and Mechanized Travel (Wilderness)	60,000	60,000	60,000	60,000	60,000	60,000	60,000

Travel designations have the greatest direct effect on both transportation routes and travel conditions. Travel Management Areas (TMAs) are a planning tool to address area-specific travel issues. TMAs are used to identify where unique travel management circumstances require a particular focus, specific management prescriptions, or additional analysis. TMAs can be used to separate specific areas from the larger planning area for a variety of reasons, such as the area's complexity or level of controversy, the need for higher-level public involvement, consideration of special resource characteristics, or manageability of the area (Maps 79 through 84).

Using the TMA planning tool, a comparison of each of the action alternatives were acreage proportioned based on a focus that may affect route density. The No Action Alternative does not identify TMAs; therefore, no comparisons were made. Table 4-350 identifies the number of acres and percentage of planning area affected that may experience an increase or decreases in route density as well as the number of acres that are expected to experience little or no change in route density over the life of the plan.

Table 4-350. Route Density Change Based on Travel Management Area Focus by Alternative (Acres and Percentage of Planning Area)

Route Density Change	Alternative					
	I	II	III	IV	V	VI
Increase	41,000 (3%)	1,159,000 (85%)	34,000 (2%)	34,000 (2%)	3,000 (< 1%)	35,000 (3%)
Static	667,000 (49%)	213,000 (15%)	1,337,000 (98%)	0	0	1,202,000 (88%)
Decrease	664,000 (48%)	0	0	1,338,000 (98%)	1,368,000 (100%)	135,000 (9%)

The following indicators were used to analyze the impacts of Transportation and Travel actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

Impacts from Management Specific to the No Action Alternative

OPLMA's transportation designations changed the current motorized designations, and thus the No Action Alternative by closing 751,000 acres to cross-country motorized vehicle use. All of these acres are in Owyhee County. OPLMA changed all open areas to limited to designated routes, with a limited to existing routes designation in effect until a transportation plan is completed for Owyhee County lands. Cross-country motorized vehicle use would continue on 25% of the planning area. Based on current trends, motorized vehicle use would continue to increase over the long term and additional unplanned routes would continue to be established by repeated use. While not all of these acres are used for cross-country travel, there are certain activities that take users off established routes (e.g., motorized dispersed camping, some motorized hunting, and motorized recreation). Under the No Action Alternative, the allocation for travel and transportation route density would increase. Route location and condition would remain mostly unchanged.

Future road construction would be restricted in crucial wildlife habitat, riparian areas, and within one mile of bighorn sheep habitat, thereby minimizing any increase in route density in these areas. Route location and condition would remain unchanged.

Route density, location, and condition is not expected to change under the following allocations:

- 63,000 acres (5% of the planning area) where motorized vehicle use would be prohibited, including the Bruneau-Jarbidge Rivers Wilderness and Salmon Falls Creek Canyons;

- 215,000 acres (16% of the planning area) where motorized vehicle use would be limited to designated routes, including the Sand Point Area of Critical Environmental Concern (ACEC), Oregon National Historic Trail protective zone, certain cultural areas, and identified bighorn sheep habitat; and
- 751,000 acres (55%) where motorized and mechanized OHV travel would be limited to designated routes.

Seasonal restrictions on travel by over snow vehicles within identified crucial mule deer and pronghorn winter range, if the Idaho Department of Fish and Game determines harassment, could be periodically implemented.

Impacts from Management Common to All Action Alternatives

A TMP will be completed and may change route density, location, and condition. In addition, temporary and localized restrictions on travel would result in short-term limitations to access routes if the authorized officer determines that a particular type of use is causing undue impacts to resources.

Minimizing construction and maintenance of roads within or adjacent to special status wildlife and fish habitat and big game winter range during important seasonal periods would limit the disturbance these activities would have during sensitive time frames. Route location and condition may be affected by these management actions under all alternatives. Roads that did not maintain or improve other resources (e.g., sensitive species and/or habitat) would need to be mitigated, redesigned, or sited in acceptable alternative locations and would minimize increases in route density.

Special designations (i.e., Back Country Byways and National Recreation Trails) may result in funding towards improvements in route conditions; however, route density and location would remain unchanged.

Valid agreements and Memoranda of Understanding with local highway districts for road maintenance may have a limited effect on route location, and route condition may improve with applied maintenance. Route density would remain unchanged.

Impacts from Management Specific to Alternative I

In Alternative I, route density in areas open to cross-country motorized vehicle use (less than 1% of the planning area) is expected to increase based on trends and demand for motorized open areas. Route location may change and condition may improve due to increased intensity and diversity of use.

Limiting motorized vehicle use on 91% of the planning area to designated routes would limit the amount of user-created routes. Seasonal restrictions on specific routes in approximately 95,000 acres of the Herd Management Area (HMA) would decrease localized travel during these periods. Changes in route density, location, and condition in areas limited to designated routes would depend on the focus of each TMA for the TMP:

- Route density in the Canyonlands, Jarbidge Foothills, and Snake River TMAs is expected to decrease. Route location and condition may be altered to maintain or improve resources while continuing to provide public access.
- Route density in the Devil Creek TMA is expected to remain unchanged to balance access and resource uses with resource objectives. Route location and condition may be altered to maintain or improve resource integrity while continuing to provide access.
- Route density in the Deadman/Yahoo TMA is expected to increase to facilitate motorized recreational opportunities. Route location and condition may change based on intensity and diversity of use.

Compared to the current situation, route density would decrease in areas limited to designated routes. An estimated 48% of the planning area is within a TMA expected to experience a decrease in route density, and 49% is within a TMA expected to retain the same route density. Route location and condition would remain unchanged.

Route density, location, and condition are not expected to change in areas closed to motorized vehicle use: the Salmon Falls Creek ACEC and the Bruneau-Jarbidge Rivers Wilderness, Lands with Wilderness Characteristics, and Lower Salmon Falls Creek Wilderness Study Area (WSA).

This alternative would maintain the option for hunters to retrieve big game using motorized vehicles within 300 feet of a designated route, but not within areas closed to motorized vehicle use. While this is not likely to take place across the planning area since big game hunting does not occur across the entire area, certain areas may show an increase in routes due to localized game retrieval. Game retrieval may increase route density and may affect route location if the disturbance created during retrieval is subsequently used for unauthorized general travel. Route condition would remain unchanged.

Site specific exceptions to motorized vehicle restrictions could be authorized in a lease, permit, or right-of way. Written permission by the authorized officer would be required for other activities (non-BLM entities), involving motorized cross-country travel in areas limited or closed (e.g., noxious weed control, surveying, access to private lands, and animal damage control efforts). These actions may affect route density, location, and condition in localized areas or on a short-term basis.

Travel would be limited when the danger of fire is high by temporarily closing or restricting access to identified areas. This would be a temporary spatial restriction on access, with no long-term impacts on travel and transportation.

Allowing motorized cross-country travel to a camp site within 25 feet of a designated route, excluding areas closed to motorized vehicle use, riparian areas, wilderness, and the WSA, would not affect route density, location, and condition.

Impacts from Management Specific to Alternative II

Under Alternative II, no designated open areas to motorized vehicles would be allocated.
Motorized transportation and travel would be limited to designated or existing routes in 95% of the planning area. Changes in route density, location, and condition in areas limited to designated routes would depend on the focus of each TMA:

- Route density in the Canyonlands TMA is expected to remain unchanged to balance access and resource uses with resource objectives. Route location and condition would be prescribed to maintain or improve resources while continuing to provide access.
- Route density in the Bruneau Desert TMA is expected to increase due to the focus on facilitation of commercial uses while mitigating impacts to resources. Route location and condition may be prescribed to maintain or improve resources while continuing to provide access.
- Route density is expected to increase in 84% of the planning area. Route location may stay the same, or change on a case-by-case basis to meet resource objectives or facilitate resource use. Route condition may change in order to facilitate resource use.
- Route density, location, and condition are not expected to change in the Bruneau-Jarbidge Rivers Wilderness and Lower Salmon Falls Creek WSA.

Alternative II would maintain the option for hunters to retrieve big game using motorized vehicles off designated routes, but not within areas closed to motorized vehicle use. Certain areas may show an increase in routes due to localized game retrieval. Game retrieval may increase route density and may affect location if the disturbance created during retrieval is subsequently used for unauthorized general travel. Route condition would remain unchanged.

Site specific exceptions to motorized vehicle restrictions could be authorized in a lease, permit, or right-of way. Written permission by the authorized officer would be required for other activities (non-BLM entities), involving motorized cross-country travel in areas limited or closed (e.g., noxious weed control, surveying, access to private lands, and animal damage control efforts). These actions may affect route density, location, and condition in localized areas or on a short-term basis.

Motorized cross-country vehicle travel to a camp site within 100 feet of a designated route, excluding areas closed to motorized vehicle use, riparian areas, wilderness, and the WSA, would not affect overall route density, location, and condition.

Impacts from Management Specific to Alternative III

Under Alternative III, route density in the designated open area (less than 1% of the planning area) would increase based on trends and demand for areas open to cross-country motorized vehicle use. Route location and condition may change due to increased intensity and diversity of use.

Limiting motorized vehicle use in 95% of the planning area to designated routes or existing routes would limit new user-created routes. Seasonal restrictions on specific routes in approximately 95,000 acres of the HMA would decrease localized travel during these periods. Changes in route density, location, and condition in areas limited to designated routes would depend on the focus of each TMA:

- Route density in the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs is expected to remain unchanged to balance access and resource uses with resource objectives and facilitate fire suppression and prevention. Route location and condition may be altered to maintain or improve access for wildland fire suppression and/or prevention.
- Route density in the Deadman/Yahoo TMA is expected to increase to facilitate motorized recreational opportunities. Route location and condition may change based on intensity and diversity of use.

Ninety-eight percent of the planning area is expected to retain the same route density. Compared to the current situation, density would be similar. Route location may change and condition may improve based on the needs of fire suppression planning and management.

Route density, location, and condition are not expected to change in the Bruneau-Jarbidge Rivers Wilderness or the Salmon Falls Creek ACEC.

Site specific exceptions to motorized vehicle restrictions could be authorized in a lease, permit, or right-of way. Written permission by the authorized officer would be required for other activities (non-BLM entities), involving motorized cross-country travel in areas limited or closed (e.g., noxious weed control, surveying, access to private lands, and animal damage control efforts). These actions may affect route density, location, and condition in localized areas or on a short-term basis.

Travel would be limited when the danger of fire is high by temporarily closing or restricting access to specific areas. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel.

The use of motorized vehicles to retrieve big game off designated routes would not be allowed.

Motorized cross-country travel to a camp site within 25 feet of a designated route, excluding areas closed to motorized vehicle use, riparian areas, wilderness, and the WSA, would not affect route density, location, and condition.

Impacts from Management Specific to Alternative IV

Under Alternative IV, route density in the designated open area (less than 1% of the planning area) would increase based on trends and demand for motorized open areas. Route location and condition may change due to increased intensity and diversity of use.

Limiting motorized vehicle use in 93% of the planning area to designated routes or existing routes would limit the creation of user-created routes. Changes in route density, location, and condition in areas limited to designated routes would depend on the focus of each TMA:

- Route density in the Canyonlands, Devil Creek, Jarbidge Foothills, and Snake River TMAs is expected to decrease for protection of wildlife habitat and restoration activities. Public access would still be provided. Route location and condition may be prescribed to maintain or improve resources while continuing to provide public access.

- Route density in the Deadman/Yahoo TMA is expected to increase to facilitate motorized recreational opportunities. Route location and condition may change based on intensity and diversity of use.

Ninety-eight percent of the planning area is expected to experience a decrease in route density. Two percent of the planning area is expected to experience an increase in route density. Compared to the current situation, density would decrease. Route location and condition would remain generally unchanged.

Route density, location, and condition are not expected to change in the Bruneau-Jarbidge Rivers Wilderness, Lands with Wilderness Characteristics, and Lower Salmon Falls Creek WSA.

Site specific exceptions to motorized vehicle restrictions could be authorized in a lease, permit, or right-of way. Written permission by the authorized officer would be required for other activities (non-BLM entities), involving motorized cross-country travel in areas limited or closed (e.g., noxious weed control, surveying, access to private lands, and animal damage control efforts). These actions may affect route density, location, and condition in localized areas or on a short-term basis.

Travel would be limited when the danger of fire is high by temporarily closing or restricting access to identified areas. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel.

The use of motorized vehicles to retrieve big game off designated routes would not be allowed.

Motorized cross-country travel to a camp site within 25 feet of a designated route, excluding areas closed to motorized vehicle use, riparian areas, wilderness, and the WSA, would not affect route density, location, and condition.

Impacts from Management Specific to Alternative V

The designation of open motorized areas in the Yahoo Special Recreation Management Area (1,000 acres) would not affect route density. Route location and condition may change due to increased intensity and diversity of use.

Limiting motorized vehicle use in 88% of the planning area to designated routes, or existing routes would limit the creation of user-created routes. Changes in route density, location, and condition in areas limited to designated routes would depend on the focus of each TMA:

- Route density in the Devil Creek, Jarbidge Foothills, Snake River, and West Side TMAs is expected to decrease to accommodate habitat restoration and for preservation of key habitat size for sage-grouse and other special status species. Route location and condition may be prescribed to maintain or improve resources while continuing to provide public access.
- Route density in the Yahoo TMA is expected to increase to facilitate motorized recreational opportunities. Route location and condition may change based on intensity and diversity of use.

Ninety-nine percent of the planning area is expected to experience a decrease in route density. Less than 1% of the planning area is expected to experience an increase in route density. Compared to the current situation, density would decrease. Route location and condition would remain generally unchanged.

Motorized travel by lessees, BLM permit holders, and right-of-way holders would be restricted by allowing no exceptions to the use of designated routes in limited areas.

Written permission by the authorized officer would be required for other activities (non-BLM entities), involving motorized cross-country travel in areas limited or closed (e.g., noxious weed control, surveying, access to private lands, and animal damage control efforts). These actions may affect route density, location, and condition in localized areas or on a short-term basis.

Travel would be limited when the danger of fire is high by temporarily closing or restricting access to identified areas. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel.

The use of motorized vehicles to retrieve big game off designated routes would not be allowed.

Motorized cross-country travel to a camp site within 25 feet of a designated route, excluding areas closed to motorized vehicle use, riparian areas, wilderness and the WSA, would not affect route density, location, and condition.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, route density in the designated open area (less than 1% of the planning area) would increase based on trends and demand for areas open to cross-country motorized vehicle use. Route location and condition may change due to increased intensity and diversity of use.

Limiting motorized vehicle use in 95% of the planning area to designated routes or existing routes would limit the creation of user-created routes. Changes in route density, location, and condition in areas limited to designated routes would depend on the focus of each TMA:

- Route density in the Canyonlands, Devil Creek, and Snake River TMAs is expected to remain unchanged to balance access and resource uses with resource objectives and to increase key habitat size for sage-grouse and big game while providing for motorized and non-motorized recreation opportunities. Route location and condition may be prescribed to maintain or improve resources while continuing to provide public access.
- Route density in the Deadman/Yahoo TMA is expected to increase to facilitate motorized recreational opportunities. Route location and condition may change based on intensity and diversity of use.
- Route density in the Jarbidge Foothills TMA is expected to decrease to increase core habitat size for sage-grouse and big game while providing for motorized and non-motorized recreation opportunities.
- Route location and condition may be altered to maintain or improve resources while continuing to provide public access.

Eighty-eight percent of the planning area is expected to retain the same route density. Compared to the current situation, density would be similar. Route location may change and condition may improve based on the needs of fire suppression and habitat restoration planning and management activities.

Route density, location, and condition are not expected to change in the Salmon Falls Creek ACEC and the Bruneau-Jarbidge Rivers Wilderness, and Lower Salmon Falls Creek WSA.

Site specific exceptions to motorized vehicle restrictions could be authorized in a lease, permit, or right-of way. Written permission by the authorized officer would be required for other activities (non-BLM entities), involving motorized cross-country travel in areas limited or closed (e.g., noxious weed control, surveying, access to private lands, and animal damage control efforts). These actions may affect route density, location, and condition in localized areas or on a short-term basis.

Travel would be limited when the danger of fire is high by temporarily closing or restricting access to identified areas. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel.

The use of motorized vehicles to retrieve big game off designated routes would not be allowed.

Motorized cross-country vehicle travel to a camp site within 100 feet of a designated route, would not affect route density, location, and condition.

Impacts from Fish and Wildlife Actions

Management may restrict, relocate, upgrade condition, or close routes through riparian areas. Actions to protect upland wildlife habitat and reduce habitat fragmentation may change the density, location, and

availability of routes, including spatial and temporal use restrictions (New Mexico Department of Game and Fish, 2005).

The following indicators were used to analyze the impacts of Fish and Wildlife actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

Impacts from Management Specific to the No Action Alternative

Route location and condition may be changed to facilitate improvement of fisheries habitat. Route density would remain unchanged.

Impacts from Management Common to All Action Alternatives

Route density would decrease and route location may change to improve wildlife species habitat. Route condition would remain unchanged.

Route density is not expected to change under the following actions. Route location and condition may change to facilitate improvement of fisheries habitat:

- Eliminating, modifying, or relocating transportation routes or restricting current travel practices as required within or near non-game fish habitat.
- Eliminating, modifying, or relocating transportation routes or restricting current travel practices in response to inventory, monitoring, and adaptive management within or near non-game fish habitat
- Eliminating, modifying, or relocating transportation routes or restricting current travel practices within or near Riparian Conservation Areas.

Impacts from Management Specific to Alternative I

Route location and condition may change to facilitate protection or improvement of streams. Route density would remain unchanged.

Route density would decrease and route location may change to improve big game habitat. Route condition would remain unchanged.

Impacts from Management Specific to Alternative II

Route location and condition may change to facilitate protection or improvement of streams. Route density would remain unchanged.

Impacts from Management Specific to Alternative III

Route location and condition may change to facilitate protection or improvement of streams. Under this alternative, route density would remain unchanged.

Route location and condition may change to provide wildland fire suppression while maintaining wildlife habitat in native communities. Route density would remain unchanged.

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Route location and condition may change to facilitate protection or improvement of streams. Route density would remain unchanged.

Route density would decrease and route location may change to maintain or improve wildlife habitat. Route condition would remain unchanged.

Impacts from Special Status Species Actions

Management of special status species may restrict access and activities that would interfere with their protection. Management actions to maintain or improve special status species habitat, including spatial and temporal use restrictions, may change the density, location, and availability of routes.

The following indicators were used to analyze the impacts of Special Status Species actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

Impacts from Management Specific to the No Action Alternative

Route density may be maintained or decreased to protect or enhance Endangered, Threatened, and other special status species habitats. Individual route location may also be changed in special status species habitat. Route condition would remain mostly unchanged.

Under this alternative, certain actions relate to the allowable level of development or disturbance within special status species habitat and to the alteration of special status species habitat. Route density would remain unchanged. Route location may be restricted through construction to avoid special status species habitat. Route condition may also be changed by allowable maintenance schedule.

Impacts from Management Common to All Action Alternatives

Although none of the management actions identified to conserve sage-grouse and special status species specifically mention transportation and travel activities, the actions addressed below would affect transportation and travel. All authorized activities and uses that would affect special status species, including transportation and travel components, would be addressed through project-specific design, consultation, or mitigation.

Route construction and maintenance may be impacted to avoid direct disturbance of special status species habitat. Route density may not be affected. Route location and condition may be affected based on efforts to avoid disturbance.

Elimination, modification, or relocation of transportation routes or restrictions to current travel practices within or near Riparian Conservation Areas may be implemented. Based on management actions in the *Riparian Areas and Wetlands* section, route density may decrease. Route location and condition may be changed to facilitate improvement of aquatic species habitat and riparian areas.

Elimination, modification or relocation of transportation routes or restrictions to current travel practices within or near special status species habitat may be implemented. Based on guidelines set forth by best management practices, route density may remain the same or decrease. Route location and condition may be changed to facilitate improvement of aquatic species habitat and riparian areas.

Some actions would require the removal, modification, or relocation of routes to improve habitat for fish and aquatic special status species. Route density may remain the same or decrease. Route location and condition may be changed to reduce impacts to aquatic and special status species habitat.

Impacts from Management Specific to Alternatives I and III

The objectives for Alternatives I and III entail restrictions on routes or access and route density may be maintained or decreased to meet the objective of maintaining or improving habitat. Individual route location may be changed within areas of sage-grouse and other special status species habitat. Route condition would remain mostly unchanged.

Transportation routes associated with range infrastructure may be impacted by constraining future construction and maintenance of those routes, and possibly requiring modification or removal of existing

routes. Route density may decrease, and location and condition may be changed by enhancement of special status species habitat.

Route density, location, and condition within one mile of known ferruginous hawk or prairie falcon nests may be seasonally restricted to minimize impacts to the prey base and nesting material.

Impacts from Management Specific to Alternative II

The objective for Alternative II may result in the seasonal restriction of routes and access. Route density may remain unchanged to maintain the quality of special status species habitat. Individual route location may be changed within areas of sage-grouse and special status species concern. Route condition would remain mostly unchanged.

Transportation routes associated with range infrastructure may be impacted by constraining future construction and maintenance of those routes, and possibly requiring modification or removal of existing routes. Route density may not be affected. Location and condition may change to enhance special status species habitat.

Impacts from Management Specific to Alternative IV

The objective for Alternative IV could entail restrictions on routes and access. Route density may be maintained or decreased to meet this objective. Individual route location may also be changed within areas of sage-grouse and other special status species habitat. Route condition would remain mostly unchanged.

Transportation routes associated with range infrastructure may be impacted by constraining future construction and maintenance of those routes, and possibly requiring modification or removal of existing routes. Route density may be decreased; route location and condition may change by enhancement of special status species habitat.

Impacts from Management Specific to Alternative V

Range infrastructure usually entails a transportation route. No additional routes would be established and existing routes may be modified resulting in impacts to transportation and travel. Route density would most likely decrease, and location and condition may change by enhancement of special status species habitat.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Same objectives as Alternative IV, except travel in the sage-grouse management area may be impacted due to specific construction and maintenance restrictions. New route construction would be built to the minimum standard necessary and no improvement to existing routes would occur unless necessary for fire suppression or to protect health and safety resulting to impacts to route condition and location. Route density may be maintained or decreased to meet this objective.

Impacts from Wildland Fire Ecology and Management Actions

Wildland fire prevention and suppression may produce impacts to transportation and travel. Routes may be relocated or improved to support fire prevention and suppression efforts. Temporary route restrictions during periods of fire danger include limitations on access.

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

Impacts from Management Specific to the No Action Alternative

No wildland fire ecology management actions specific to the No Action Alternative would have a detectable or measurable effect on route density, location, and condition.

Impacts from Management Common to All Action Alternatives

Management actions common to all action alternatives would restrict access during the prescribed rest period for treatment areas or until emergency stabilization and burned area rehabilitation objectives are met. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel. Route density, location, and condition would remain unchanged.

Impacts from Management Specific to Alternative I

Construction of new roads, or road improvements in areas of limited access, would replace or improve existing routes consistent with other resource objectives. There would be no change in route density. Location and condition may change for improvement of response time to support fire suppression activities.

When the danger of fire is high, travel would be impacted by temporarily closing or restricting access to identified areas. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel. Route density, location, and condition would remain unchanged.

Impacts from Management Specific to Alternative II

Construction of new roads in areas of limited access may establish additional routes consistent with resource use objectives. This would increase route density. Route location and condition may change to improve response time to support fire suppression activities.

Route establishment and designation adjacent to permanent fencing may slightly increase density and direct route location in project areas. Route condition would remain unchanged.

Impacts from Management Specific to Alternative III

Construction of new roads in areas of limited access would replace or improve existing routes. There would be no change in route density. Location and condition may change to improve response time to support fire suppression activities.

Closing of primitive roads and trails and open areas during fire restrictions would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel. Route density, location, and condition would remain unchanged.

Impacts from Management Specific to Alternative IV

Roads in areas of limited access would be replaced or improved consistent with other resource objectives. There would be no change in route density. Location and condition may change to improve response time to support fire suppression activities.

Temporarily closing or restricting access to identified areas could impact travel when the fire danger is high. This would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel. Route density, location, and condition would remain unchanged.

Impacts from Management Specific to Alternative V

Modifications or improvements to routes in areas of limited access would replace or improve existing routes consistent with other resource objectives, not affecting route density. Location and condition may change for improvement of response time to support fire suppression activities.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Construction of new roads in areas of limited access would replace or improve existing routes. There would be no change in route density. Location and condition may change to improve response time to support fire suppression activities.

Closing of roads, primitive roads, and trails and open areas during fire restrictions would be a temporary spatial restriction on access, with no long-term impacts on transportation and travel. Route density, location, and condition would remain unchanged.

Impacts from Recreation Actions

The following indicators were used to analyze the impacts of Recreation actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

Focused management of Special Recreation Management Areas (SRMAs) and Extensive Recreation Management Areas (ERMAs) may result in a change of route density, location, or condition.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would contain five SRMAs totaling 86,000 acres. Until activity plans are developed, no focused management would be initiated, and the effects of the designations would be minor. The primary activity in the Hagerman-Owsley Bridge SRMA (3,000 acres) would continue to be off-highway vehicle riding. The amount of activity is expected to continue to increase within this SRMA. SRMA allocations would have no impact on route density, location or condition without activity plans.

The identification of road access needs as part of the Recreation Activity Management Plans for the Bruneau-Jarbidge River, Hagerman-Owsley Bridge, Jarbidge Forks, Oregon Trail, and Salmon Falls Creek SRMAs may result in an adjustment in transportation routes. This proposes no specific changes to route density, location and condition.

Under the following actions, route density, location, and condition would be addressed on a site-specific basis and would not affect the travel and transportation network:

- A variety of means to maintain or improve recreation opportunities, including route manipulation, may affect transportation routes.
- Allowing modification of routes and restrictions of travel as needed to protect resources and reduce use conflicts may impact transportation and travel.
- Allowing development of access routes to meet existing or anticipated demand may impact transportation and travel.

Impacts from Management Common to All Action Alternatives

Route density, location, and condition would be addressed on a site-specific basis as needed and would not affect the transportation and travel network:

- Transportation and travel may be impacted by SRMA implementation plans.
- Transportation and travel may be impacted by route designation criteria and guidelines that protect identified resources and enhance recreation opportunities.

Impacts from Management Specific to Alternative I

Under Alternative I, seven SRMAs would be designated for a total of 325,000 acres. This may result in change of routes to accommodate prescribed management for the individual SMRAs. These changes would mostly affect route location and condition. Route density would likely remain unaffected or decrease to meet the objectives of the individual SRMAs. The Deadman/Yahoo SRMA would be an exception as route density may increase.

The Canyonlands SRMA (149,000 acres) and Jarbidge Foothills SRMA (133,000 acres) would focus management on non-motorized recreation, decreasing route density. Route location and condition would be affected while continuing to allow public access for anticipated recreation use.

The Deadman/Yahoo SRMA (36,000 acres) would provide opportunities for cross-country motorized vehicle use, with an expected increase in route density, potential changes in route location, and changes in route condition.

The Jarbidge Forks SRMA (2,000 acres) would focus management on river-based recreation and road-accessible developed sites. Route density, location, and condition would remain unaffected.

The Little Pilgrim SRMA (300 acres) would focus management on fishing and hunting. Route density would be decreased, and location and condition would be improved to mitigate impacts related to transportation and travel.

The Salmon Falls Reservoir SRMA (5,000 acres) would include improved access, parking, and boat-launching facilities. This would result in changes to routes to accommodate prescribed management. These changes would mostly affect route location and condition. Route density would likely remain unaffected or increase slightly to meet the objectives of the SRMA.

Access would be provided to maintain visitor health and safety, mitigate conflicts, or protect natural resource values on the 1,046, 000 acres of lands not designated as Recreation Management Areas (RMAs). This would be similar to current recreation management of these lands and would have minor impacts to transportation and travel.

Impacts from Management Specific to Alternative II

Under Alternative II, three SRMAs would be designated for a total of 7,000 acres. This would result in changes to routes to accommodate prescribed management for the individual SMRAs. These changes would mostly affect route location and condition. Route density would likely remain unaffected to meet the objectives of the individual SRMAs.

Impacts from the Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs would be the same as in Alternative I.

The Deadman and Yahoo areas could be developed cooperatively with the State, counties, or local communities to provide opportunities for cross-country motorized vehicle use, with an expected increase in route density, potential changes in route location, and changes in route condition.

Access would be provided to maintain visitor health and safety, mitigate conflicts, or protect natural resource values on the 1,364,000 acres of lands not designated as RMAs. This provision would be similar to current recreation management of these lands and would have minor impacts to route density, location, and condition.

Impacts from Management Specific to Alternative III

Under Alternative III, five SRMAs would be designated for a total of 42,000 acres. This would result in changes to routes to accommodate prescribed management for the individual SMRAs. These changes would mostly affect route location and condition. Route density would likely remain unaffected or decrease to meet the objectives of the individual SRMAs.

The Deadman/Yahoo SRMA (34,000 acres) would provide opportunities for cross-country motorized vehicle use, with an expected increase in route density, potential changes in route location, and changes in route condition.

Impacts from the Jarbidge Forks, Little Pilgrim, and Salmon Falls Reservoir SRMAs would be the same as in Alternative I.

Access would be provided to maintain visitor health and safety, mitigate conflicts, or protect natural resource values on the 1,329,000 acres of lands not designated as RMAs. This would be similar to current recreation management of these lands and would have minor impacts to route density, location, and condition.

Impacts from Management Specific to Alternative IV

Under Alternative IV, four SRMAs would be designated for a total of 190,000 acres. This would result in change to routes to accommodate prescribed management for the individual SMRAs. These changes

would mostly affect route location and condition. Route density would likely remain unaffected or decrease to meet the objectives of the individual SRMAs.

The Canyonlands SRMA (149,000 acres) would focus management on non-motorized recreation, decreasing route density. Route location and condition would be affected while continuing to allow public access for anticipated recreation use.

Impacts from the Deadman/Yahoo SRMA would be the same as in Alternative III.

Impacts from the Jarbidge Forks and Salmon Falls Reservoir SRMAs would be the same as in Alternative I.

Access would be provided to maintain visitor health and safety, mitigate conflicts, or protect natural resource values on the 1,181,000 acres of lands not designated as RMAs. This would be similar to current recreation management of these lands and would have minor impacts to route density, location, and condition.

Impacts from Management Specific to Alternative V

Under Alternative V, two SRMAs would be designated for total of 5,000 acres. This could result in changes to routes to accommodate prescribed management for the individual SRMAs. These changes would mostly affect route location and condition. Route density would likely remain unaffected or decrease to meet the objectives of the individual SRMAs. The Yahoo SRMA would be an exception as route density may increase.

Impacts from the Jarbidge Forks SRMA would be the same as in Alternative I.

The Yahoo SRMA (3,000 acres) would provide opportunities for cross-country motorized vehicle use, with an expected increase in route density, potential changes in route location, and changes in route condition.

Access would be provided to maintain visitor health and safety, mitigate conflicts, or protect natural resource values on the 1,366,000 acres of lands not designated as RMAs. This would be similar to current recreation management of these lands and would have minor impacts to route density, location, and condition.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, six SRMAs would be designated for a total of 20,000 acres. This would result in changes to routes to accommodate prescribed management for the individual SMRAs. These changes would mostly affect route location and condition. Route density would likely remain unaffected or decrease to meet the objectives of the individual SRMAs.

The Deadman and Yahoo SRMAs (16,000 acres) would provide opportunities for cross-country motorized vehicle use, with an expected increase in route density, potential changes in route location, and changes in route condition.

Impacts from the Jarbidge Forks and Little Pilgrim SRMAs would be the same as in Alternative I.

Alternative VI would designate 304,000 acres of ERMAs. This would result in changes to routes to accommodate prescribed management for the individual ERMAs. These changes would mostly affect route location and condition. Route density could be affected in order to ensure compatibility with other resource objectives.

Access would be provided to maintain visitor health and safety, mitigate conflicts, or protect natural resource values on the 1,047,000 acres of lands not designated as RMAs. This would be similar to current recreation management of these lands and would have minor impacts to route density, location, and condition.

Impacts from Land Use Authorization Actions

The extent and intensity of land use authorizations may affect the density, location, and condition of transportation routes because routes are usually needed for construction, maintenance, and support of structures authorized by land use authorizations. The acres available for land use authorizations refer to the areas outside right-of-way (ROW) exclusion areas and outside avoidance areas and the areas outside ROW exclusion but within ROW avoidance areas. Lands in the latter category may be available for ROWs if the proposal is consistent with ROW avoidance area stipulations.

The following indicators were used to analyze the impacts of Land Use Authorizations actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

Impacts from Management Specific to the No Action Alternative

New ROWs requiring new or upgraded access roads would impact transportation and travel. Route density may increase, and location and condition may change. In the No Action Alternative, the available acres for land use authorizations would be 1,309,000 acres. The expected wind energy development area would include 111,000 acres. If this acreage were developed, route density would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Management Specific to Alternative I

In Alternative I, the available acres for land use authorizations would be 1,308,000 acres. The expected wind energy development area would include 39,000 acres. If this acreage were developed, route density would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Management Specific to Alternative II

In Alternative II, the available acres for land use authorizations would be 1,309,000 acres. The expected wind energy development area would include 127,000 acres. If this acreage were developed, route density would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Management Specific to Alternative III

In Alternative III, the available acres for land use authorizations would be 1,308,000 acres. The expected wind energy development area would include 50,000 acres. If this acreage were developed, route density would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Management Specific to Alternative IV

In Alternative IV, the available acres for land use authorizations would be 1,272,000 acres. The expected wind energy development area would include 37,000 acres. If this acreage were developed, route density would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Management Specific to Alternative V

In Alternative V, the available acres for land use authorizations would be 1,205,000 acres. The expected wind energy development area would include 31,000 acres. If this acreage were developed, route density would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, the available acres for land use authorizations would be 1,308,000 acres. The expected wind energy development area would include 22,000 acres. If this acreage were developed, route density

would be increased, and location and condition would change. Impacts to transportation and travel would be project specific.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on transportation and travel:

- Route density,
- Route location, and
- Route condition.

ACECs are designated and managed to protect their relevant and important values. The protective management may change route density, location, and condition.

Impacts from Management Specific to the No Action Alternative

ACEC management in the No Action Alternative is expected to result in changes to route density, location, and condition in the Bruneau-Jarbidge ACEC which overlaps 44,000 acres of the Bruneau-Jarbidge Rivers Wilderness. This represents 52% of the ACEC that would be closed to motorized and mechanized use. Motorized vehicle use would be limited to designated routes in the Bruneau-Jarbidge ACEC outside the wilderness.

The remaining ACEC management for Salmon Falls Creek Canyon and Sand Point would not be expected to result in in changes to route density, location, or condition.

Impacts from Management Specific to Alternative I

Impacts from Bruneau-Jarbidge ACEC management would be the same as in the No Action Alternative. Maintaining the current level of human disturbance in the Bruneau-Jarbidge ACEC by not upgrading or constructing any new routes would have little or no impact on route density, location, or condition. On a case-by-case basis, route condition may be improved to reduce resource damage and improve public safety.

Transportation and travel would be impacted within the Middle Snake ACEC boundaries. Mitigating surface-disturbing activities and implementing restrictions to reduce soil erosion where needed may result in improving route conditions or changing route location. Route density may remain unchanged. Improving the condition and/or modifying the location of the Wilson Grade Road may be considered for fire suppression activities or research access in the Sand Point ACEC. Route density would remain unchanged.

Impacts from Management Specific to Alternative II

Under Alternative II**,** all ACEC designations in the planning area would be eliminated. Travel designations in the former Bruneau-Jarbidge ACEC would be mostly maintained due to the wilderness and the Omnibus Public Lands Management Act of 2009 travel designations for Owyhee County. Although motorized vehicle use in the Salmon Falls Creek ACEC would be changed from closed to limited, it is physically inaccessible to motorized vehicle travel. For these reasons, removal of the ACEC designations would have no expected change in route density, location, or condition.

Impacts from Management Specific to Alternative III

Motorized vehicle use in the Reduced Bruneau-Jarbidge ACEC would be the same impacts as the No Action Alternative, except 95% (57,000 acres) are within the Bruneau-Jarbidge Rivers Wilderness. Efforts to upgrade some designated routes to reduce resource damage, improve public safety, and facilitate visitor traffic would have little or no impact on route density or location. On a case-by-case basis, route condition may be improved.

Impacts to the Sand Point ACEC would be the same as described in Alternative I.

Impacts from Management Specific to Alternative IV

Designation of routes through the travel management plan process would aim to increase key sage-grouse habitat. Route density and location would be impacted. Route condition would remain unchanged.

Motorized vehicle use within the Expanded Bruneau-Jarbidge ACEC would be the same impacts as the No Action Alternative, except 49% (60,000 acres) are within the Bruneau-Jarbidge Rivers Wilderness. Maintaining the current level of human disturbance and by not upgrading or constructing new routes would have little or no impact on route density, location, or condition. On a case-by-case basis, route condition may be improved to reduce resource damage and improve public safety.

Motorized vehicle use in the Sand Point ACEC would continue to be limited to designated routes. This action would have no impact on route density, location, or condition.

Impacts to the Sand Point ACEC would be the same as described in Alternative I.

Impacts from Management Specific to Alternative V

Motorized and mechanized vehicle use in 59,000 acres (6%) of the Sagebrush Sea ACEC would be closed due to Bruneau-Jarbidge Rivers Wilderness designation.

Designation of routes through the travel management plan process would aim to increase key sage-grouse habitat. Route density and location would be impacted. Route condition would remain unchanged.

Transportation and travel would be impacted within the Middle Snake ACEC boundaries. Mitigating surface-disturbing activities and implementing restrictions to reduce soil erosion where needed may improve route conditions or change route location. Route density may remain unchanged.

Motorized vehicle use in the Sand Point ACEC would continue to be limited to designated routes. This action would have no impact on route density, location, or condition.

Impacts to the Sand Point ACEC would be the same as described in Alternative I.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Under Alternative VI, ACEC management for Salmon Falls Creek Canyon and Sand Point would not be expected to result in in changes to route density, location, or condition.

Impacts to the Sand Point ACEC would be the same as described in Alternative I.

The management for the Upper Bruneau Canyon ACEC would maintain the current level of human disturbance by not upgrading or constructing new routes and would have little or no impact on route density, location, or condition. On a case-by-case basis, route condition may be improved to reduce resource damage and improve public safety.

Summary of Direct and Indirect Impacts

The primary sources of impacts to transportation and travel are discussed below. This section compares the effects of the No Action Alternative and the six action alternatives on transportation and travel. Where particular factors are considered a primary source of impact, they are addressed.

Impacts from the No Action Alternative

In the No Action Alternative, route density is expected to increase over the life of the plan as a result of the number of acres open to cross-country motorized vehicle use and available for right-of-way development. Increasing population and motorized vehicle use may result in an increased number of user-created routes and route density. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would contribute to an increase in the route density. The No Action Alternative would result in a moderate increase in route density in the long term.

Individual route location and condition may be changed on a case-by-case basis to meet resource objectives, including those for special status species, but no major location or condition changes are

expected for the entirety of the transportation and travel network. Route location and condition could change due to the amount of transportation required by the various land use authorizations.

Impacts from Alternative I

Under Alternative I, 49% of the planning area is expected to remain at the same route density, and 48% is expected to experience a decrease in route density. The reduction in areas open to cross-country motorized vehicle use reduces the likelihood of new user-created routes, and based on the increase in area limited to designated routes and the focus of the Travel Management Areas (TMAs), overall route density in the planning area is expected to decrease. Route density may also be affected by management strategies to avoid or reduce wildlife habitat fragmentation and facilitate maintenance or improvement of streams. The allocation of Special Recreation Management Areas (SRMAs) with focused management would impact route density by specifying objectives for recreation uses and experiences including transportation and travel; the Deadman/Yahoo SRMA, which includes a larger area (4,000 acres) open to cross-country motorized vehicle use, is expected to increase routes and attract additional use to that area. Alternative I would results in a minor decrease in route density in the long term.

The reduction in open acreage would result in a major reduction in the area available for cross-country motorized vehicle use; however, the travel designations for Alternative I would continue to provide access within the majority of the planning area.

Individual route location and condition may change on a case-by-case basis to meet resource objectives, including objectives for wildlife, special status species, wildland fire, and Areas of Critical Environmental Concern (ACECs); route location and condition may also change to accommodate transportation and travel within SRMAs. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would contribute to an increase in the route density. Route condition would likely be improved and additional routes would be constructed in new locations.

Impacts from Alternative II

Under Alternative II, 84% of the planning area is expected to experience an increase in route density, and 16% is expected to remain at the same route density. No acres would be open to cross-country motorized vehicle use. Based on the commodity and resource use emphasis and the focus of the TMAs, overall route density is expected to increase in the planning area. Alternative II would result in a moderate increase in route density in the long term.

The reduction in open acreage significantly reduces the area available for cross-country motorized vehicle use, and reduces the likelihood of new user-created routes; however, the travel designations for Alternative II would continue to provide access within the majority of the planning area.

Individual route location and condition may change on a case-by-case basis to meet resource objectives, including objectives for wildlife and special status species; route density, location, and condition may also change to accommodate wildland fire objectives. The allocation of SRMAs with focused management would not affect overall route density unless a Recreation and Public Purposes Act lease arrangement was made for the Deadman/Yahoo area. Route location and condition may change to accommodate transportation and travel within SRMAs. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would contribute to an increase in the route density. Route condition would likely be improved and additional routes would be constructed in new locations.

Impacts from Alternative III

Under Alternative III, 98% of the planning area is expected to remain at the same route density, and 2% is expected to experience an increase in route density. The reduction in open acreage significantly reduces the area available for cross-country motorized vehicle use, and reduces the likelihood of new user-created routes, and based on the increase in area limited to designated routes and the focus of the TMAs, overall route density in the planning area is expected to remain mostly unchanged. These designations would continue to provide access within the majority of the planning area. The allocation of SRMAs with focused management would impact route density by specifying objectives for recreation

uses and experiences including transportation and travel; increased route density due to off-highway vehicle (OHV) use in the Deadman/Yahoo SRMA are expected due to the larger area (4,000 acres) open to cross-country motorized vehicle use. Overall, Alternative III would result in a minor increase in route density in the long term.

Route density may increase, and route location and condition may improve to meet fire suppression and prevention activities. Individual route location may be changed on a case-by-case basis to meet objectives for wildland fire ecology and management. Overall route condition improvement is expected to facilitate fire suppression.

Individual route location and condition may change on a case-by-case basis to meet resource objectives, including objectives for wildlife, special status species, and ACECs. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would contribute to an increase in the route density. Route condition would likely be improved and additional routes would be constructed in new locations.

Impacts from Alternative IV

Under Alternative IV, 2% of the planning area is expected to experience an increase in route density, and 98% is expected to experience a decrease in route density. The reduction in areas open to cross-country motorized vehicle use reduces the likelihood of new user-created routes, and based on the increase in area limited to designated routes and the focus of the TMAs, overall route density in the planning area is expected to decrease. These designations would continue to provide access within the majority of the planning area and no major location or condition changes are expected for the entirety of the transportation and travel network. Route density may also be affected by management strategies for maintenance and restoration of fish and wildlife habitat. The allocation of SRMAs with focused management would impact route density by specifying objectives for recreation uses and experiences including transportation and travel. Route location and condition may change to accommodate transportation and travel within SRMAs; increased route density due to OHV use in the Deadman/Yahoo SRMA are expected due to the larger area (4,000 acres) open to cross-country motorized vehicle use. Overall, Alternative IV would result in a minor decrease in route density in the long term.

Individual route location and condition may be changed on a case-by-case basis to meet resource objectives, including objectives for special status species and ACECs; route location and condition may improve to meet resource objectives for fire suppression activities. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would contribute to an increase in the route density. Route condition would likely be improved and additional routes would be constructed in new locations.

Impacts from Alternative V

Alternative V would have the largest expected decrease in route density within 99% of the planning area. The reduction in areas open to cross-country motorized vehicle use reduces the likelihood of new user-created routes, and based on the increase in area limited to designated routes and the focus of the TMAs, overall route density in the planning area is expected to decrease. These designations would continue to provide access within the majority of the planning area and no major location or condition changes are expected for the entirety of the transportation and travel network. Route density and location may also be affected by management strategies to maintain habitat integrity of fish and wildlife. The allocation of SRMAs with focused management may decrease route density by specifying objectives for recreation uses and experiences including transportation and travel. Route location and condition may change to accommodate transportation and travel within SRMAs. Overall, Alternative V would result in a major decrease in route density in the long term.

Individual route location and condition may be changed on a case-by-case basis to meet resource objectives, including objectives for special status species and ACECs; route location and condition may improve to meet resource objectives for fire suppression activities. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would

contribute to an increase in the route density. Route condition would likely be improved and additional routes would be constructed in new locations.

Impacts from Alternative VI (Proposed RMP)

Under Alternative VI, 88% of the planning area is expected to remain at the same route density, and 10% is expected to experience a decrease in route density. The reduction in open acreage significantly reduces the area available for cross-country motorized vehicle use, and reduces the likelihood of new user-created routes, and based on the increase in area limited to designated routes and the focus of the TMAs, overall route density in the planning area is expected to remain mostly unchanged. These designations would continue to provide access within the majority of the planning area. The allocation of SRMAs with focused management would impact route density by specifying objectives for recreation uses and experiences including transportation and travel; increased route density due to OHV use in the Deadman and Yahoo SRMAs are expected due to the larger area (4,000 acres) open to cross-country motorized vehicle use. Overall, Alternative VI would result in a minor increase in route density in the long term.

Route density may increase, and route location and condition may improve to meet fire suppression and prevention activities. Individual route location may be changed on a case-by-case basis to meet objectives for wildland fire ecology and management. Overall route condition improvement is expected to facilitate fire suppression.

Individual route location and condition may change on a case-by-case basis to meet resource objectives, including objectives for wildlife, special status species, wildland fire, and ACECs; route location and condition may also change to accommodate transportation and travel within SRMAs. Routes associated with the construction and maintenance of land use authorizations, such as wind energy development, would contribute to an increase in the route density. Route condition would likely be improved and additional routes would be constructed in new locations.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

When analyzing cumulative impacts on transportation and travel and management, the cumulative impact analysis area would extend beyond the planning area so that connectivity to adjacent segments of Federally managed, State, county, and highway district route networks are incorporated into the analysis. Therefore, the analysis area for cumulative impacts on travel and travel management would include portions of the BLM Elko, Burley, Bruneau, Four Rivers, and Shoshone Field Offices; the Humboldt-Toiyabe National Forest (Jarbidge Ranger District; Sawtooth National Forest (Minidoka Ranger District); and State lands.

With the enactment of the Omnibus Public Lands Management Act of 2009 (OPLMA; Public Law 111-11), all open areas in Owyhee County are limited to designated routes, with a limited to existing routes designation in effect until a transportation plan is completed. Due to the major reduction in acres open to cross-country motorized vehicle use under OPLMA, impacts from transportation and travel management under the No Action Alternative to resources such as upland vegetation and wildlife would generally decrease; impacts to resource uses would generally increase, such as the concentration of motorized recreation activities, due to the potential for decreased levels of motorized access. In general, impacts due to transportation and travel management under the No Action Alternative would be more similar to impacts under the action alternatives.

The Humboldt-Toiyabe and Sawtooth National Forests have developed transportation plans by which they would manage motorized travel. The Forest Service Travel Management Rule published in the Federal Register on November 9, 2005, followed by Travel Management Directives published December 9, 2008, mandates the development of travel plans for each forest and provides guidelines for their implementation. The plans include eliminating cross-country travel, closing roads that are unnecessary, redundant, pose maintenance problems, or compromise sensitive resources; overall reducing the volume of roads.

Area-wide transportation management planning for Federal lands managed by both the BLM and Forest Service would enhance overall travel opportunities through delineation of designated routes with maps, signage, and other quality information; the promotion of public safety, education, and involvement; improved public compliance; and maintenance of the route systems.

Coordination between the managing agencies would ensure the travel systems complement each other in terms of access opportunities provided for and route management consistency. Overall miles of designated routes, however, would be reduced from the current transportation systems, while opportunities of cross-country travel throughout the public lands would be reduced. Much of the reduction would be due to the elimination of redundant or unnecessary routes, as well as the limitation or preclusion of routes in some areas in order to protect important, sensitive values. The overall reduction in miles of routes is not anticipated to displace travel to other public lands outside the planning area, particularly given the national travel management strategies being implemented by the BLM and Forest Service.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect transportation and travel:

- Wildland Fire Ecology and Management,
- Transportation and Travel, and
- Land Use Authorizations.

These actions are described in the *Introduction* to this chapter.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative

Large land areas experiencing frequent wildland fires would continue to be an issue related to cross-country motorized travel. Continuing the current management would maintain 25% of the planning area open to cross-country travel. Increased cross-country motorized vehicle use would continue in popular open areas and new off-highway vehicle technology may encourage expansion into new areas. Continued development of travel plans on adjacent public land may contribute to an increased use of remaining open areas within the planning area. New land use authorization may increase routes for construction, operations, and maintenance. Under the No Action Alternative, cumulative impacts from past, present and reasonably foreseeable future actions would result in an increase in route density. Route location would be dependent on resource and resource use objectives. Where surface maintenance is managed by highway districts or cooperatively with the BLM, route condition would generally improve dependent on funding and demand.

Cumulative Impacts from Alternatives I, III, IV, V, and VI (Proposed RMP)

Management actions that affect transportation and travel management would include the construction of routes for fire and fuels management, to access to vegetation treatments to restore or maintain key habitat, for new routes to service land use authorizations, increases in recreational demand and visitation, and other changes in travel management from adjacent land agencies. Alternatives I, III, IV, V, and VI reduce the area open to cross-country motorized vehicle use from 25% to less than 1%. These designations restrict travel within the planning area mostly to designated routes and few additional routes would be developed. The cumulative impact from past, present and reasonably foreseeable future actions would not affect route density. Route location would be dependent on resource and resource use objectives. Where road surface maintenance is managed by highway districts, the BLM, or cooperatively, route condition would generally improve dependent on funding and demand.

Cumulative Impacts from Alternative II

Alternative II eliminates areas open to cross-country motorized vehicle use, but this alternative's emphasis on resource use combined with cumulative effects from future land use authorizations would contribute to an increase in route density over a substantial portion (84%) of the planning area. Land use authorizations and resource uses may define the need for specific route location and improved condition.

4.4.4. Land Use Authorizations

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to land use authorizations:

- **Amount of constraint on land use authorizations** – The primary factor within the alternatives that would affect where and under what conditions wind energy developments, utility lines, and roads could be authorized is the amount of constraint the alternative would place on land use authorizations; this indicator reflects the availability of the planning area for projects authorized by land use authorizations. The amount of constraint can vary widely. At one extreme, the development of these structures would be prohibited in an area, while in other areas, their development would be available. Management prescribed by the alternatives would result in various types of restrictions between these two extremes.

Methods and Assumptions

Impacts to land use authorizations from management in the following sections of Chapter 2 were analyzed in detail: *Land Use Authorizations*, *Soil Resources*, *Wildlife*, *Special Status Species*, *Paleontological Resources*, *Cultural Resources*, *Visual Resources*, and *Transportation and Travel*. Impacts from management in the *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildland Fire Ecology and Management*, *Lands with Wilderness Characteristics*, *Areas of Critical Environmental Concern*, *National Historic Trails*, *Wild and Scenic Rivers*, and *Wilderness Study Areas* sections were captured in the analysis of impacts from land use authorizations and transportation and travel actions and, to avoid repetition, were not discussed separately. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for land use authorizations. Impacts from management for land use authorizations can be found under *Impacts from Land Use Authorizations Actions* in the *Climate Change*, *Soil Resources*, *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Wildland Fire Ecology and Management*, *Wild Horses*, *Paleontological Resources*, *Cultural Resources*, *Visual Resources*, *Lands with Wilderness Characteristics*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *National Historic Trails*, *Social Conditions*, and *Economic Conditions* sections.

Land use authorizations include rights-of-way (ROWs), land use permits, and leases.[6] The most common projects authorized by ROWs are roads, power transmission lines, and fiber optic lines. Interest in developing wind energy has increased in the last 10 years as well. Other projects authorized by ROWs and land use permits include natural gas pipelines, communication sites, cathodic protection sites, water facilities, filming permits, and apiaries. To illustrate how the alternatives would constrain land use authorizations, this analysis focuses on how the alternatives would constrain future wind energy developments, overhead utility lines, and road ROWs.

Where possible, the amount of constraint on land use authorizations in each alternative was quantified through a geographic information system (GIS) analysis of the relevant allocations and management actions described in Chapter 2. Through the GIS analysis, the types of constraints were determined for each acre of BLM-managed lands within the planning area. Where management could only be analyzed qualitatively, the type of constraint was identified, and impacts were characterized as increasing or decreasing the amount of that constraint on land use authorizations. Constraints on land use authorizations were grouped into several categories:

[6] This section does not consider impacts to permits for livestock grazing and range infrastructure or Special Recreation Permits; impacts to these types of authorizations are discussed in the *Livestock Grazing* and *Recreation* sections, respectively.

- **Not available –** Land use authorizations would not be available in these areas under any circumstances; these are areas that would be identified as ROW exclusion areas.
- **Available, with constraints on location** – Land use authorizations would be available in these areas as long as they are consistent with the avoidance criteria identified in Chapter 2 or with additional mitigation.
- **Available, with constraints on timing** – Activities associated with the land use authorization (e.g., construction and maintenance) would be scheduled to avoid certain time periods.
- **Available, with constraints on project design** – Management described in the alternatives would affect the design of the project authorized by the land use authorization; effects to project design could include modifications to the structure that would result from the land use authorization.
- **Available, with no constraints on location, timing, or project design –** Management described in the alternatives would not appreciably constrain the location, timing, or project design for the land use authorization.

Areas where land use authorizations are not available would have the highest level of constraint. Areas with the other three types of constraint often overlap; for the purposes of this analysis, it is assumed that the alternatives that result in more acres with any type of constraint than other alternatives have more constraint on land use authorizations.

To analyze the types and amounts of constraint on wind energy development, the analysis focused on areas where interest in wind energy development is most likely to be highest over the life of the plan. These areas were determined through a GIS analysis of National Renewable Energy Laboratory high-resolution wind resource data, which depict the wind resource that could be used for utility-scale wind energy development. Wind resources are classified according to wind power classes, which are based on typical wind speeds 50 meters above the ground. The wind power classes for BLM-managed lands are found in Table 4-351.

Table 4-351. Expected Wind Resources within the Planning Area

Wind Power Class	Wind Resources	Wind Speed at 50 Meters (mph)	Acres Within the Planning Area	Acres Within 2 Miles of Areas Rated Fair or Higher
1	Poor	< 12.5	550,000	18,000
2	Marginal	12.5-14.3	789,000	181,000
3	Fair	14.3-15.7	27,000	27,000
4	Good	15.7-16.8	5,000	5,000
5	Excellent	16.8-17.9	2,000	2,000
6	Outstanding	17.9-19.7	400	400
7	Superb	19.7-24.8	0	0

Generally, areas rated good or better can be used for generating wind power with large turbines, but many fair areas could be suitable for utility-scale development as well (DOE, 2009). This analysis assumes that over the life of the plan, there will be more interest in developing wind energy on or within two miles[7] of lands rated fair or better than on other lands (234,000 acres; Map 98). Using GIS data, these high-interest areas were intersected with the areas available for wind energy development outside ROW exclusion and avoidance areas[8] in each alternative to yield the areas that would have the highest potential to be developed in each alternative. These areas are referred to throughout Chapter 4 as "expected wind energy development areas" and are displayed in Maps 99 through 105. The amount of constraint that management would place on the expected wind energy development area for each

[7] Because lands rated fair or better are not contiguous, it is assumed that any utility-scale wind energy development would necessarily include some lands with a lower rating in the project footprint.
[8] It is assumed that utility-scale wind energy developments would not be able to meet any of the avoidance criteria identified in the alternatives (e.g., utility-scale developments would be taller than 100 feet and therefore would not meet avoidance criteria for the US Air Force Military Operating Areas).

alternative is analyzed. The following assumption was made to determine expected wind energy development areas:

- Wind energy development would not be available in Visual Resource Management (VRM) Classes I and II.

To analyze the types and amounts of constraint on utility line development, the analysis focused on ROW corridors for utilities. These utility ROW corridors include Pilgrim Gulch, Shoestring, Balanced Rock, Saylor Creek, Jarbidge, Roseworth, and the Oil/Gas Pipelines (53,000 acres; Map 97). The amount of area within the utility ROW corridors is compared among alternatives.

There will likely be high levels of interest in new road ROWs within expected wind energy development areas and utility ROW corridors, as new or improved roads are usually necessary for construction, operation, and maintenance. However, even though it is likely there will be proposals for road ROWs outside these areas as well, there is no basis for predicting where other high-interest areas might be. As a result, this analysis assumes that the types and amounts of constraint on wind energy and utility development, as well as general constraint on land use authorizations, generally affect road ROWs also. Impacts specific to road ROWs are identified when they occur.

Other assumptions used to analyze impacts to land use authorizations include the following:

- Increased levels of constraint generally result in increased costs for constructing, operating, and maintaining structures authorized by land use authorizations.
- Constraints described for the planning area as a whole generally affect to a similar degree ROWs for projects other than wind energy developments, utility lines, and roads as well as other land use authorizations (e.g., Section 302 Federal Land Policy and Management Act of 1976 permits and leases). Impacts specific to these other types of authorizations are identified when they occur.
- Management for areas with very high potential for paleontological resources Potential Fossil Yield Classification Class 5 would place more constraint on land use authorizations than areas with lower potential for paleontological resources.
- Management for areas within VRM Classes I and II would place more constraint on land use authorizations than management for areas within VRM Classes III and IV.

Direct and Indirect Impacts

Impacts from Land Use Authorization Actions

Table 4-352 displays constraints on various types of land use authorizations due to land use authorization actions.

Table 4-352. Areas Available for Various Types of Land Use Authorizations by Alternative (Acres*)

Type of Authorization and Restriction	Alternative						
	No Action	I	II	III	IV	V	VI
All Land Use Authorizations							
Exclusion Area [A]	62,000	63,000	62,000	63,000	100,000	167,000	63,000
Avoidance Area [B]	935,000	1,001,000	1,001,000	1,001,000	1,001,000	1,227,000	1,234,000
Available[C]	374,000	369,000	370,000	369,000	335,000	144,000	136,000
Sage-Grouse Lek Restriction [D]	NA	861,000	260,000	861,000	1,025,000	963,000	931,000
Wind Energy Right-of-Way (ROW)							
Available[C]	315,000	138,000	340,000	154,000	111,000	84,000	85,000
Expected Wind Energy Development Area [E]	111,000	39,000	127,000	50,000	37,000	31,000	22,000

Type of Authorization and Restriction	Alternative						
	No Action	I	II	III	IV	V	VI
Wind Energy Right-of-Way (ROW)							
Expected Wind Energy Development Area with Sage-Grouse Lek Restriction	46,000	7,000	27,000	18,000	5,000	0	0
Utility ROW Corridors							
Utility ROW Corridors [F]	30,000	53,000	53,000	53,000	53,000	53,000	43,000

* Several ROW avoidance areas overlap; where this occurs, all avoidance stipulations must be met. In addition, some ROW avoidance areas overlap with ROW exclusion areas; where this occurs, the more restrictive exclusion management applies.
[A] Refers to areas within ROW exclusion areas that are not available for ROWs.
[B] Refers to areas outside ROW exclusion areas but within ROW avoidance areas; lands in this category would be available for ROWs if the proposal is consistent with ROW avoidance area stipulations.
[C] Refers to areas outside ROW exclusion and avoidance areas.
[D] Refers to the restrictions placed on land use authorizations to prohibit locating structures within a defined distance of occupied sage-grouse leks.
[E] Includes lands within two miles of areas rated fair or better for wind resource potential that are also outside avoidance and exclusion areas.
[F] Includes lands identified in each alternative as utility ROW corridors that are outside ROW exclusion areas. Impacts on utility development from management actions in other sections are assessed according to the proportion of the utility ROW corridors affected.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would constrain land use authorizations for energy, transportation, or communication purposes in areas identified as avoidance areas in the 1987 Jarbidge RMP. As a result, land use authorizations for those purposes would not be available on 5% of the planning area. The expected wind energy development area would consist of 47% of the lands within two miles of areas rated fair or better for wind resource potential; wind energy development would be further constrained by being restricted from wildlife habitat where effects could not be mitigated.

The utility ROW corridors would consist of Pilgrim Gulch, Shoestring, Balanced Rock, and Saylor Creek. These utility ROW corridors total about 30,000 acres (Map 97).

The No Action Alternative would not prohibit locating structures associated with utility lines, communication towers, and wind energy developments within a pre-defined distance from active sage-grouse leks; it would require construction and maintenance activities to be scheduled to avoid or minimize disturbance to sage-grouse within two miles from an occupied or unknown sage-grouse lek. The location for communication sites would be constrained by requiring them to be located at existing sites to the extent possible; in addition, they would only be considered if there is a demonstrated need and resource conflicts are low or can be mitigated.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The best management practices contained within Appendix B would place a variety of constraints on wind energy developments, including constraints on location, timing, and project design. These would be applied on a project-specific basis; therefore, the type and degree of impact would depend on resources present at the project location.

Impacts from Management Common to All Action Alternatives

Management common to all action alternatives would constrain the location for projects authorized by land use authorizations by requiring new ROWs for utility developments to be placed in utility ROW corridors where practical. Other new land use authorizations would be co-located in areas of previous disturbance such as along existing ROWs, roads, fences or pipelines where practical. The Aquatic and

Riparian Management Strategy would place constraints on the design of the project to mitigate impacts to riparian areas. Communication sites would continue to be co-located with existing sites to the extent possible.

Impacts from Management Specific to Alternative I

In Alternative I, ROWs would not be available in 5% of the planning area; ROWs would be available in avoidance areas in 73% of the planning area if the avoidance stipulations described in Chapter 2 could be met.

Wind energy developments would be constrained by being limited to areas with annual or non-native vegetation communities. As a result, wind energy developments would be available in 10% of the planning area. Integrating these results with the wind resource data, the expected wind energy development area for Alternative I would consist of 17% of lands within two miles of areas rated fair or better.

The utility ROW corridors for Alternative I would consist of Pilgrim Gulch, Shoestring, Balanced Rock, Saylor Creek, and Jarbidge. These corridors total about 53,000 acres (Map 97). Alternative I would prohibit locating structures associated with utility lines, communication towers, and wind energy developments within three miles of an occupied or unknown status sage-grouse lek, which would affect about 19% of the planning area, and 3% of the expected wind energy development area. Alternative I would also place a constraint on location for land use authorizations for communication sites and wind energy by restricting these projects in special status species habitat unless any direct and indirect adverse effects can be mitigated; this restriction would also apply to wind energy developments that may affect cultural resources.

Impacts from Management Specific to Alternative II

In Alternative II, ROWs would not be available in 5% of the planning area; ROWs would be available in avoidance areas in 73% of the planning area if the avoidance stipulations described in Chapter 2 could be met.

Wind energy developments would be considered consistent with stipulations for ROW avoidance areas and outside ROW exclusion areas. As a result, wind energy developments would be available in 25% of the planning area. Integrating these results with the wind resource data, the expected wind energy development area for Alternative II would consist of 54% of lands within two miles of areas rated fair or better.

The utility ROW corridors would be the same as described in Alternative I.

Alternative II would prohibit locating structures associated with utility lines, communication towers, and wind energy developments within one mile of an occupied sage-grouse lek, which would affect 19% of the planning area and 12% of the expected wind energy development area. Alternative II would also place a constraint on project design for land use authorizations for communication sites by requiring the site to be designed to mitigate impacts to special status species and their habitats where practical. A constraint on location for land use authorizations for wind energy would restrict these projects in habitat for Endangered, Threatened, Proposed, and Candidate species unless their direct adverse effects can be mitigated.

Impacts from Management Specific to Alternative III

In Alternative III, ROWs would not be available in 5% of the planning area; ROWs would be available in avoidance areas in 73% of the planning area if the avoidance stipulations described in Chapter 2 could be met.

Wind energy developments would be constrained by being limited to areas with annual or non-native vegetation communities. As a result, wind energy developments would be available in 11% of the planning area. Integrating these results with the wind resource data, the expected wind energy development area for Alternative III would consist of 21% of lands within two miles of areas rated fair or better.

The utility ROW corridors would be the same as described in Alternative I.

Alternative III would prohibit locating structures associated with utility lines, communication towers, and wind energy developments within three miles of an occupied or unknown status sage-grouse lek, which would affect 63% of the planning area, and 8% of the expected wind energy development area. Alternative III would also place a constraint on project design for land use authorizations for communication sites by requiring the site to be designed to mitigate impacts to special status species and their habitats where practical. A constraint on location for land use authorizations for wind energy would restrict these projects in special status species habitat unless direct and indirect adverse effects can be mitigated; this restriction would also apply to wind energy developments that may affect cultural resources.

Impacts from Management Specific to Alternative IV

In Alternative IV, ROWs would not be available in 7% of the planning area; ROWs would be available in avoidance areas in 73% of the planning area if the avoidance stipulations described in Chapter 2 could be met.

Wind energy developments would be constrained by being limited to areas with annual or non-native vegetation communities. As a result, wind energy developments would be available in 11% of the planning area. Integrating these results with the wind resource data, the expected wind energy development area for Alternative IV would consist of 16% of lands within two miles of areas rated fair or better.

The utility ROW corridors would be the same as described in Alternative I.

Alternative IV would prohibit locating structures associated with utility lines, communication towers, and wind energy development within five miles of an occupied or unknown status sage-grouse lek, which would affect 75% of the planning area, and 2% of the expected wind energy development area. Alternative IV would also place a constraint on location for land use authorizations for communication sites and wind energy by restricting these projects in special status species habitat unless direct and indirect adverse effects can be mitigated; this restriction would also apply to wind energy developments that may affect cultural resources.

Impacts from Management Specific to Alternative V

In Alternative V, ROWs would not be available in 12% of the planning area; ROWs would be available in avoidance areas in 89% of the planning area if the avoidance stipulations described in Chapter 2 could be met.

Wind energy developments would be constrained by being limited to areas with annual or non-native vegetation communities. As a result, wind energy developments would be available in 6% of the planning area. Integrating these results with the wind resource data, the expected wind energy development area for Alternative V would consist of 13% of lands within two miles of areas rated fair or better.

The utility ROW corridors would be the same as described in Alternative I.

Alternative V would prohibit locating structures associated with utility lines, communication towers, and wind energy development within sage-grouse habitat. As in Alternatives I and IV, Alternative V would also place a constraint on location for land use authorizations for communication sites and wind energy by restricting these projects in special status species habitat unless direct and indirect adverse effects can be mitigated; this restriction would also apply to wind energy developments that may affect cultural resources.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, ROWs would not be available in 5% of the planning area; ROWs would be available in avoidance areas in 90% of the planning area if the avoidance stipulations described in Chapter 2 could be met.

Wind energy developments would not be permitted inside sage-grouse habitat. As a result, wind energy developments would be available in 6% of the planning area. Integrating these results with the wind resource data, the expected wind energy development area for Alternative VI would consist of 13% of lands within two miles of areas rated fair or better.

The utility ROW corridors for Alternative VI would consist of Pilgrim Gulch, Shoestring, Balanced Rock, Saylor Creek, Roseworth, and Oil/Gas Pipelines. These utility ROW corridors total about 43,000 acres (Map 97).

Alternative VI would prohibit locating structures associated with utility lines, communication towers, and wind energy development within sage-grouse habitat, which would affect 68% of the planning area. Alternative VI would also place a constraint outside sage-grouse habitat, renewable energy site testing, monitoring, and development should avoid special status species habitat unless unavoidable adverse effects can be mitigated. New communication sites would also avoid special status species habitat if the project would have an adverse effect, unless those adverse effects could be mitigated.

Impacts from Soil Resources Actions

Restrictions on uses in areas with potential for soil erosion by wind or water would constrain wind energy developments, utility lines, and roads by requiring additional mitigation measures or surface occupancy restrictions to reduce impacts to those areas, which could increase project costs. Table 4-353 summarizes the constraints on land use authorizations from soil resources actions.

Table 4-353. Soil-Related Restrictions that Would Affect the Amount of Mitigation Required for Land Use Authorizations by Alternative (Acres)

Acres with Constraint	Alternative						
	No Action	I	II	III	IV	V	VI
By Type of Constraint In Planning Area [A]							
Water Erosion	NA	412,000	412,000	412,000	1,212,000	1,151,000	1,247,000
Wind Erosion	NA	217,000	218,000	217,000	1,079,000	1,036,000	1,092,000
Slope	NA	38,000	38,000	38,000	33,000	28,000	38,000

[A] "Planning Area" refers to areas outside right-of-way (ROW) exclusion areas.

Impacts from Management Specific to the No Action Alternative

Soil management direction for the No Action Alternative does not specifically reference land use authorizations. The general guidelines provided would result in negligible impacts to land use authorizations, as they only require soil resources be considered in project-level planning.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Minimizing soil erosion by maintaining adequate perennial vegetation cover would result in minor constraints to activities and structures associated with land use authorizations, as all disturbed areas would need to be reseeded to provide perennial vegetation cover.

Impacts from Management Common to All Action Alternatives

Modifying routes or mitigating the erosive effects of transportation and travel would affect land use authorizations as it would apply to road ROWs as well as ancillary routes developed or used for wind energy or utility developments.

Impacts from Management Specific to Alternatives I, II, and III

Management specific to Alternatives I, II, and III would result in more constraints to land use authorizations than the No Action Alternative. These alternatives would require mitigation on soils with severe or very severe potential for wind erosion or with high potential for water erosion. In these areas as well as areas with slopes greater than 20%, an erosion control strategy would be required. Forty-nine percent of the planning area would require additional mitigation by these soil resource actions.

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Management specific to Alternatives IV, V, and VI would require more soil-related mitigation for land use authorizations than in the No Action Alternative and Alternatives I, II, and III. Alternatives IV, V, and VI would require mitigation on soils with moderate, severe, or very severe potential for wind erosion or with medium or high potential for water erosion. In these areas as well as areas with slopes between 20% and 40%, an erosion control strategy would be required. No surface disturbance from construction, operation, and maintenance of land use authorizations would be available on slopes greater than 40% however, these areas could still be included within a project area (e.g., lay adjacent to a wind tower or beneath an overhead utility line). Seventy-nine to 91% of the planning area would require soil-related mitigation. These actions would constrain over 90% of the expected wind energy development areas and the utility ROW corridors for all of the alternatives.

Impacts from Wildlife Actions

Land use authorizations can often be constrained by wildlife management requirements that modify construction and maintenance activities to avoid or minimize disturbance to wildlife during important seasonal periods. While not affecting where projects can be located, this management would affect how long it would take to build the project and when maintenance could occur; both of these could increase project costs. The degree of impact would be related to the species in the project area as well as timing. Table 4-354 displays the acres impacted by timing restrictions.

Table 4-354. Planning Area Acres Outside Right-of-Way Exclusion Areas with Timing Restrictions by Alternative

Timing Constraint	Alternative						
	No Action	I	II	III	IV	V	VI
Sage-Grouse Habitat [A]	292,000	292,000	292,000	292,000	261,000	227,000	931,000
Big Game Winter Range	156,000	845,000	0	0	808,000	0	845,000

[A] Timing restrictions for sage-grouse would be from December through June for the No Action Alternative and from mid-February through mid-June for Alternatives I through VI.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would place constraints on timing of construction and maintenance in key sage-grouse habitat from mid-February through mid-June and in mule deer or pronghorn winter range from December through April.[9] As a result, construction and maintenance activities would be restricted for four to five months of the year.

Impacts from Management Common to All Action Alternatives

Management common to all action alternatives would place a constraint on project design for land use authorizations in habitat for migratory birds; projects would be required to promote the maintenance and improvement of the quantity and quality of migratory bird habitat. Projects would need to avoid, reduce, or mitigate impacts to the extent feasible.

Management common to all action alternatives would also require construction and maintenance activities to avoid or minimize disturbance to priority wildlife species during their important seasonal periods. These constraints on timing for activities associated with land use authorizations have been incorporated into the discussion for management specific to each action alternative, as the priority wildlife species vary by alternative.

[9] Sage-grouse are discussed in this section to simplify comparison with the action alternatives. Timing restrictions are prescribed for other species as well; sage-grouse, mule deer, and pronghorn are used to illustrate how the timing restriction would affect activities associated with land use authorizations.

Impacts from Management Specific to Alternative I

Alternative I would give special status species[10] and mule deer highest priority for habitat management. The timing restriction on construction and maintenance activities would restrict those activities in key sage-grouse habitat from mid-February through mid-June and in mule deer winter range from December through March. As a result, construction and maintenance activities would be restricted in areas with either sage-grouse or mule deer for four to six and a half months of the year.

Impacts from Management Specific to Alternatives II and III

Alternatives II and III would give sage-grouse and other special status species highest priority for habitat management. The timing restriction on construction and maintenance activities would restrict those activities in key sage-grouse habitat from mid-February through mid-June. As a result, construction and maintenance activities would be restricted for four months of the year.

Impacts from Management Specific to Alternative IV

Alternative IV would give sage-grouse, other special status species, mule deer, and pronghorn highest priority for habitat management. The timing restriction on construction and maintenance activities would restrict those activities in key sage-grouse habitat from mid-February through mid-June and in mule deer and pronghorn winter range from December through March. As a result, construction and maintenance activities would be restricted on for four to six and a half months of the year (i.e., areas with either sage-grouse or mule deer and/or pronghorn).

Impacts from Management Specific to Alternative V

The type of impacts from management specific to Alternative V would be the same as for Alternative II, but the scale would differ as none of the expected wind energy development areas for Alternative V would be constrained for four months, and some of the utility ROW corridors for Alternative V would also be constrained.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The type of impacts from management specific to Alternative VI would be the same as for Alternative IV; Alternative VI would give sage-grouse, other special status species, mule deer, and pronghorn highest priority for habitat management. The timing restriction on construction and maintenance activities would restrict those activities in the sage-grouse management area from mid-February through mid-June and in mule deer and pronghorn winter range from December through March. As a result, construction and maintenance activities would be restricted on for four to six and a half months of the year (i.e., areas with either sage-grouse or mule deer and/or pronghorn).

Impacts from Special Status Species Actions

Management for special status species would constrain land use authorizations in special status species habitat by requiring additional mitigation measures to reduce impacts to those areas. Some management would also affect the location of structures or the timing of construction and maintenance activities.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would constrain land use authorizations if those projects would adversely impact special status plants throughout the planning area. Land use authorizations would also be constrained if the project area included areas within 0.75 miles of ferruginous hawk and prairie falcon nests. The other occupancy restrictions described in the No Action Alternative would also constrain land use authorizations; all of these would be determined on a case-by-case basis.

[10] To simplify comparison of alternatives, when special status species are noted as priority wildlife species, sage-grouse is the species used to illustrate how the timing restriction would affect activities associated with land use authorizations.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

If biological opinions or letters of concurrence contain conservation measures that relate to land use authorizations, projects in habitats for the relevant special status species would be constrained. The degree of constraint would be relative to the specific species and conservation measure involved.

Impacts from Management Common to All Action Alternatives

Special status species management common to all action alternatives would constrain land use authorizations if the project would adversely affect special status species, as these activities would not be allowed without mitigation. The degree of constraint would be relative to the specific mitigation required. Other constraints on location include not locating new communication sites in special status species habitat unless impacts can be mitigated and avoiding locating utility lines in native shrubland and native grassland communities. Where avoiding native communities would not be possible, additional mitigation would be required. Restricting right-of-way construction and maintenance activities during important seasonal periods for special status species introduces a constraint on timing; the magnitude of these timing constraints for land use authorizations in sage-grouse habitat has been discussed above under *Impacts from Wildlife Actions*.

Impacts from Management Specific to Alternatives I, III, IV, V, and VI (Proposed RMP)

Alternatives I, III, IV, V, and VI would all result in restrictions on land use authorizations if the project area included areas within one mile of ferruginous hawk or prairie falcon nests by requiring project design features to be designed to minimize impacts to their prey base and availability of nesting material from March through July. The level of constraint would be greater than in the No Action Alternative.

Impacts from Management Specific to Alternative II

Alternative II would result in restrictions on land use authorizations if the project area included areas within 0.25 miles of ferruginous hawk or prairie falcon nests; this would be less constraining than the No Action Alternative and Alternatives I, III, IV, V, and VI.

Impacts from Paleontological Resources Actions

Many projects authorized by land use authorizations typically disturb both surface and subsurface sediments. Major transmission lines, buried gas pipelines, road construction, and wind energy developments, in particular, require substantial subsurface excavations that may impact buried fossil deposits. As a result, management for paleontological resources would likely constrain land use authorizations. This management constraint would only apply where paleontological resources are present. The area's most likely to be affected by management for paleontological resources are those with high or very high potential for paleontological resources (Potential Fossil Yield Classification [PFYC] Classes 4 and 5, respectively). However, because the planning area does not contain any PFYC Class 4 areas, this analysis considers only those areas in PFYC Class 5. Table 4-355 displays acres rated as PFYC Class 5 that would constrain land use authorizations.

Table 4-355. Potential Fossil Yield Classification Class 5 Areas in Expected Wind Energy Development Areas and Utility Right-of-Way Corridors by Alternative (Acres)

Area	Alternative						
	No Action	I	II	III	IV	V	VI
Planning Area [A]	121,000	121,000	121,000	121,000	121,000	121,000	121,000
Expected Wind Energy Development Area	18,000	13,000	18,000	13,000	13,000	13,000	11,000
Utility ROW Corridors	10,000	10,000	10,000	10,000	10,000	10,000	11,000

[A] Refers to areas outside right-of-way (ROW) exclusion areas.

The amount of constraint for paleontological resources in the context of the entire planning area would be the same for all alternatives. Within the expected wind energy development areas for each alternative, the No Action Alternative and Alternative II would have the least constraint as a smaller percent of their expected wind energy development areas would be affected. Alternative V would have the most

constraint as its expected wind energy development area would have the largest acreage affected. Within the utility ROW corridors for each alternative, all of the alternatives would be equally constrained. However, the amount of constraint as a percent of the expected wind energy development area and utility ROW corridors does not differ substantially between alternatives.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would provide for managing paleontological resources to protect, maintain, or enhance sites or areas for their scientific and educational values. Any land use authorizations would be constrained to the extent the activities would impact paleontological resources; land use authorizations in areas rated as PFYC Class 5 would be most likely to be affected by this management (121,000 acres). The expected wind energy development area for the No Action Alternative contains 18,000 acres (16% of the area) rated as PFYC Class 5 that would likely be constrained by paleontological resource actions; the utility ROW corridors for the No Action Alternative contain 10,000 acres (33% of the area) that would be similarly constrained.

Impacts from Management Common to All Action Alternatives

Land use authorizations in paleontological resource areas would be required to implement measures to protect those resources; land use authorizations in areas rated as PFYC Class 5 would be most likely to be affected by this management (121,000 acres). The degree of constraint on land use authorizations would be relative to the specific measures required. This constraint would also be likely on 33% of the expected wind energy development areas for Alternative I; 14% for Alternative II; 26% for Alternative III; 35% for Alternative IV; 42% for Alternative V; and 50% for Alternative VI. This constraint would likely be in 19% of the utility ROW corridors for all alternatives except Alternative VI, which would be constrained by 26%.

Impacts from Cultural Resources Actions

Cultural resource management would constrain land use authorizations, primarily by affecting where projects could be located or their design. While these constraints would not create additional right-of-way (ROW) exclusion areas, they may result in modifying the location or route of certain projects or additional mitigation for impacts to those areas. To illustrate how impacts of cultural resource management differ by alternative, this section focuses on how management described for the Kelton and Toana Freight Roads and playas would affect land use authorizations; these cultural resources were selected because their locations are known and have been mapped. Table 4-356 displays the constraints on land use authorizations resulting from management for the Kelton and Toana Freight Road protective corridors. Land use authorizations within the available area, the expected wind energy development area, and the utility ROW corridors would be constrained by cultural resource management to a similar degree in all alternatives.

Table 4-356. Areas with Constraints Due to the Kelton and Toana Freight Road Protective Corridors by Alternative (Acres)

Area	Alternative						
	No Action	I	II	III	IV	V	VI
Planning Area [A]	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Expected Wind Energy Development Area	7,000	2,000	7,000	4,000	1,000	1,000	0
Utility ROW Corridors	2,000	3,000	3,000	3,000	3,000	3,000	3,000

[A] Refers to areas outside ROW exclusion areas.

Impacts from Management Specific to the No Action Alternative

Management specific to the No Action Alternative would constrain land use authorizations by requiring projects located within the Kelton and Toana Freight Road protective corridors (20,000 acres) to protect those cultural resources. This would require modifications to specific siting of the structures associated with the project or to the project design. This constraint would apply to a relatively small portion of the

planning area (1%); 6% of the expected wind energy development areas and 6% of the utility ROW corridors for the No Action Alternative would be affected.

Impacts from Management Common to All Action Alternatives

Management common to all action alternatives would require land use authorizations to comply with all cultural resource laws and regulations and include measures to minimize or prevent damage to cultural resources. The degree of constraint this would place on a specific land use authorization would depend on the type and location of the project. The Kelton and Toana Freight Road protective corridors (20,000 acres) would be managed as avoidance areas for surface-disturbing activities, which would constrain land use authorizations. This constraint would apply to a relatively small portion of the available area (less than 1%). This constraint would apply in 5% of the expected wind energy development area for Alternative I, 6% for Alternative II; 8% for Alternative III; 3% for Alternatives IV and V; and 0% of the expected wind energy development area for Alternative VI. This constraint would also apply in 6% of the utility ROW corridors for all action alternatives except in Alternative VI which would be 7%.

Impacts from Management Specific to Alternatives I, IV, V, and VI (Proposed RMP)

In Alternatives I, IV, V, and VI, land use authorizations that include areas within 300 feet of playas would be required to minimize or avoid ground-disturbance in those areas (1,000 acres). This constraint would apply to a negligible portion of the planning area (less than 1%); none of the expected wind energy development areas for Alternatives I, IV, V, and VI would be affected.

Impacts from Management Specific to Alternatives II and III

In Alternatives II and III, land use authorizations that include areas within 150 feet of playas would be required to minimize or avoid ground-disturbance in those areas (600 acres). This constraint would apply to a negligible portion of the planning area (less than 1%). Less than 1% of the expected wind energy development area for Alternative II; none of the expected wind energy development area for Alternative III; and none of the utility ROW corridors for either alternative would be affected.

Impacts from Visual Resources Actions

Visual resource allocations prescribe the level of change to the visual landscape that would be managed in specific areas. Areas in Visual Resource Management (VRM) Class I or II are managed to preserve or retain the existing character of the landscape, which would constrain land use authorizations by requiring mitigation and modifications to the project design that would tend to increase overall project costs. Planning Area refers to areas outside right-of-way (ROW) exclusion areas.

Land use authorizations in the planning area would have the least constraint due to VRM in Alternatives II and III; Alternative I would have the most constraint. Within the expected wind energy development area for each alternative, all the action alternatives would have a similar level of constraint; the No Action Alternative would have the most constraint due to VRM in its utility ROW corridors.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 13% (178,000 acres) of the planning area would be managed to preserve or retain its existing visual character (VRM Class I and II areas); this would result in moderate to major constraints on land use authorizations within those areas. Wind energy development and utility development would not be available within VRM Classes I and II; approximately 6,000 acres (11%) within the utility ROW corridors are within VRM Classes I or II and would be unavailable for development.

Impacts from Management Common to All Action Alternatives

The degree to which ensuring authorized uses are designed to meet VRM objectives would affect land use authorizations would depend on where projects would be located. Those located in VRM Class I and II areas would have more constraint than those located in VRM Class III and IV areas. New ROWs would meet VRM class objectives and utility ROW corridors would be managed as VRM Class III. Wind energy development would not be available within VRM Classes I and II.

Impacts from Management Specific to Alternative I

In Alternative I, 17% (235,000 acres) of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on land use authorizations within those areas.

Impacts from Management Specific to Alternatives II and III

In Alternatives II and III, 1% (36,000 acres combined) of the planning area would be managed to preserve or retain its existing visual character; this would result in minor constraints on land use authorizations within those areas.

Impacts from Management Specific to Alternative IV

In Alternative IV, 7% (96,000 acres) of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate constraints on land use authorizations within those areas.

Impacts from Management Specific to Alternative V

In Alternative V, 15% (205,000 acres) of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on land use authorizations within those areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 8% (104,000 acres) of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate constraints on land use authorizations within those areas.

Impacts from Transportation and Travel Actions

Transportation and travel designations and actions can affect where and how motorized vehicles can be used during construction and maintenance of land use authorization projects. These actions could affect whether a road right-of-way (ROW) could be granted. Motorized vehicle use associated with land use authorizations (e.g., construction and maintenance activities), as well as road ROWs, would need to be consistent with designations for transportation and travel. Areas open to cross-country motorized vehicle use would place the least amount of constraint on vehicle use for construction and maintenance, as vehicles would not be restricted to routes in those areas. Conversely, motorized vehicles could not be used for construction and maintenance and road ROWs would not be granted in areas closed to motorized vehicle use. Motorized vehicle use and road ROWs would need to follow designated routes in areas limited to designated routes; alternately, new routes for these authorizations could be designated as well. Table 4-357 displays constraints on land use authorizations from transportation and travel management.

Table 4-357. Areas with Travel Designations that Would Affect Land Use Authorizations by Alternative (Acres)

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Planning Area [A]							
Open to Cross-Country Motorized Vehicle Use	342,000	4,000	0	4,000	700	700	4,000
Closed to Motorized Vehicle Use	1,000	53,000	0	0	0	0	1,000
Expected Wind Energy Development Areas							
Open to Cross-Country Motorized Vehicle Use	76,000	900	0	800	0	0	400
Closed to Motorized Vehicle Use	0	0	0	0	0	0	0

Travel Designation	Alternative						
	No Action	I	II	III	IV	V	VI
Utility ROW Corridors							
Open to Cross-Country Motorized Vehicle Use	24,000	1,000	0	1,000	500	500	1,000
Closed to Motorized Vehicle Use	0	1,000	0	100	1,000	1,000	200

[A] Refers to areas outside ROW exclusion areas.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 25% of the planning area would have the lowest level of constraint due to transportation and travel allocations, while less than 1% would have the highest level of constraint. None of the expected wind energy development areas for the No Action Alternative would have the lowest or highest level of constraint. Within the utility ROW corridors for the No Action Alternative, 45% would have the lowest level of constraint, and no acres would be affected by the highest level of constraint.

Impacts from Management Common to All Action Alternatives

Most transportation and travel management actions common to all action alternatives would not affect land use authorizations. Whether a route is necessary for authorized activities including land use authorizations would be part of the criteria for determining whether a specific route would be designated, modified, or closed.

Impacts from Management Specific to Alternative I

In Alternative I, less than 1% of the planning area would have the lowest level of constraint due to transportation and travel allocations, while 4% would have the highest level of constraint. Site-specific exceptions to motorized vehicle restrictions could be authorized in the lease, permit, or grant. Within the expected wind energy development area for Alternative I, less than 1% would have the lowest level of constraint, while no acres would have the highest. Within the utility ROW corridors for Alternative I, 2% would have the lowest level of constraint, and 2% would have the highest. Access and use restrictions during fire restrictions would also constrain activities associated with land use authorizations if they are scheduled to occur during that time.

Impacts from Management Specific to Alternative II

In Alternative II, none of the planning area would have the lowest level of constraint due to transportation and travel allocations, and no acres would have the highest level of constraint. Site-specific exceptions to motorized vehicle restrictions could be authorized in the lease, permit, or grant. None of the expected utility development and expected wind energy development areas for Alternative II would have the highest level of constraint. There would be no access or use restrictions during fire restrictions in Alternative II; as a result, activities associated with land use authorizations would not be affected.

Impacts from Management Specific to Alternative III

In Alternative III, less than 1% of the planning area would have the lowest level of constraint due to transportation and travel allocations, and no acres would have the highest level of constraint. Site-specific exceptions to motorized vehicle restrictions could be authorized in the lease, permit, or grant. Less than 1% of the expected wind energy development area for Alternative III would have the lowest, while none would have the highest level of constraint. Within the utility ROW corridors for Alternative III, 2% would have the lowest level of constraint, and less than 1% would have the highest. Primitive roads, trails, and areas open to cross-country motorized vehicle use would be closed during fire restrictions, which would affect activities associated with land use authorizations if they are scheduled to occur during that time.

Impacts from Management Specific to Alternative IV

In Alternative IV, less than 1% of the planning area would have the lowest level of constraint due to transportation and travel allocations, while no acres would have the highest level of constraint. Site-specific exceptions to motorized vehicle restrictions could be authorized in the lease, permit, or grant. None of the expected wind energy development area for Alternative IV would have the lowest or highest

level of constraint. Within the utility ROW corridors for Alternative IV, 1% would have the lowest level of constraint, while 2% would have the highest. Access and use restrictions during fire restrictions would also constrain activities associated with land use authorizations if they are scheduled to occur during that time.

Impacts from Management Specific to Alternative V

In Alternative V, less than 1% of the planning area would have the lowest level of constraint due to transportation and travel allocations, while no acres would have the highest level of constraint. None of the expected wind energy development area for Alternative V would have the lowest or highest level of constraint. No exceptions to motorized vehicle restrictions would be made. Within the utility ROW corridors for Alternative V, 1% would have the lowest level of constraint, while 2% would have the highest. Access and use restrictions during fire restrictions would also constrain activities associated with land use authorizations if they are scheduled to occur during that time.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, less than 1% of the planning area would have the lowest level of constraint due to transportation and travel allocations, while less than 1% would have the highest level of constraint. Less than 1% of the expected wind energy development area for Alternative VI would have the lowest, while no acres would have the highest level of constraint. Within the utility ROW corridors for Alternative VI, 2% would have the lowest level of constraint, while less than 1% would have the highest. Access and use restrictions during fire restrictions would also constrain activities associated with land use authorizations if they are scheduled to occur during that time. Seasonal restrictions may be placed on motorized travel within the Herd Management Area during foaling if a conflict is identified.

Summary of Direct and Indirect Impacts

Table 4-358, Table 4-359, and Table 4-360 summarize the constraints on road rights-of-way (ROWs) and other land use authorizations throughout the planning area, on utility ROW corridors, and wind energy ROWs within expected wind energy development areas. A Geographic Information System analysis was used to overlay the various types of constraints to determine the acres with at least one constraint on land use authorizations.

Table 4-358. Constraints on Rights-of-Way and Other Land Use Authorizations in the Planning Area by Alternative (Percent of Planning Area [A])

Constraint	Alternative						
	No Action	I	II	III	IV	V	VI
Exclusion	5	5	5	5	7	12	5
Avoidance	68	73	73	73	73	89	90
Within Sage-Grouse Lek Radius	0	63	19	63	75	70	10
Soil Constraints	0	48	48	48	92	86	93
Wildlife Seasonal Constraints	21	62	21	21	59	17	68
Paleontological Constraints	9	9	9	9	9	9	9
Kelton and Toana Freight Road Protective Corridors	1	1	1	1	1	1	1

Constraint	Alternative						
	No Action	I	II	III	IV	V	VI
Visual Resource Constraints	13	17	1	1	7	15	8
Highest Transportation Constraint	< 1	4	0	0	0	0	< 1

[A] Percentages calculated using footprint acres of constraints as described in direct and indirect impacts analysis; many of these constraints overlap. The planning area refers to areas outside ROW exclusion areas.

Impacts from the No Action Alternative

Overall, the No Action Alternative would place the least amount of constraint having a minor impact on land use authorizations of all the alternatives, including road, wind energy, and utility ROW corridors and other land use authorizations. The No Action Alternative would have one of the lowest amounts of ROW exclusion areas, similar to Alternative II. The No Action Alternative would have the lowest amount of ROW avoidance areas, making the largest area available for land use authorizations. In areas where land use authorizations would be allowed, there would be few additional constraints, with no specific constraints for soils or exclusion within a pre-defined distance from occupied and unknown status sage-grouse leks. Transportation and travel management would give projects flexibility where routes could be located and how construction and maintenance activities would be implemented. Overall, there would be few constraints on location, timing, or project design compared to the action alternatives.

The No Action Alternative would have the highest acreage available for wind energy development within two miles of land rated fair or better for wind resources and the lowest acreage available for the utility ROW corridors. Within these expected utility and wind energy development areas, there would be comparatively few constraints.

Overall, there would be no change in the level of constraint on land use authorizations.

Table 4-359. Constraints on Wind Energy Rights-of-Way within the Expected Wind Energy Development Area by Alternative

	Alternative						
	No Action	I	II	III	IV	V	VI
Expected Wind Energy Development Area							
Acres of Expected Wind Energy Development Area	111,000	39,000	127,000	50,000	37,000	31,000	22,000
Percent of Expected Wind Energy Development Area [A]	47	17	54	21	16	13	9
Percent of Expected Wind Energy Development Area with Constraints [B]							
Within Sage-Grouse Lek Radius	41	18	21	36	14	0	0
Soil Constraints	94	95	93	90	92	94	91
Wildlife Seasonal Constraints	0	27	50	22	16	94	0
Paleontological Constraints	16	33	14	26	35	42	50
Kelton and Toana Freight Road Protective Corridors	6	5	6	8	3	3	0
Visual Resource Constraints	0	0	0	0	0	0	0

	Alternative						
	No Action	I	II	III	IV	V	VI
Percent of Expected Wind Energy Development Area with Constraints [B]							
Highest Transportation Constraint	0	0	0	0	0	0	0

[A] Within two miles of lands rated fair or better for wind resources (234,000 acres).
[B] Percentages are based on footprint acres of each constraint; many of these constraints overlap.

Table 4-360. Constraints on Utility Right-of-Way Corridors by Alternative

	Alternative						
	No Action	I	II	III	IV	V	VI
Utility ROW Corridors							
Acres [A]	30,000	53,000	53,000	53,000	53,000	53,000	43,000
Percent of the Utility ROW Corridors with Constraints							
Within Sage-Grouse Lek Radius	0	9	9	38	45	45	5
Soil Constraints	97	94	94	94	94	94	95
Wildlife Seasonal Constraints	0	45	9	9	24	7	6
Paleontological Constraints	33	19	19	19	19	19	26
Kelton and Toana Freight Road Protective Corridors	7	6	6	6	6	6	7
Visual Resource Constraints	2	< 1	< 1	< 1	< 1	< 1	1
Highest Transportation Constraint	0	2	0	< 1	2	2	< 1

[A] Footprint acres.
[B] Percentages are based on footprint acres of each constraint; many of these constraints overlap.

Impacts from Alternative I

Overall, Alternative I would have the fourth highest amount of constraint having a moderate impact on land use authorizations in the planning area. Alternative I would have the second lowest amount of ROW exclusion areas, similar to Alternatives III and VI, while having the third highest amount of ROW avoidance areas, similar to Alternatives II, III, and IV. There would be several additional constraints, including specific constraints for wildlife seasonal periods, soils, and distance from sage-grouse leks, than the No Action Alternative, having a minor impact on land use authorizations. Alternative I would also have the highest acreage with visual resource constraints. Alternative I would have the highest constraint with transportation and travel management which would give projects much less flexibility than the other alternatives where routes could be located and how construction and maintenance would be implemented. Overall, this would increase constraint on location, timing, and project design having a moderate impact on land use authorizations.

Alternative I would have the fourth lowest acreage available for wind energy development within two miles of land rated fair or better for wind resources and the highest acreages available for utility ROW corridors similar to Alternatives II, III, IV, and V. The expected wind energy development areas for Alternative I would have the fourth lowest amount of constraints and the utility ROW corridors would have the second highest amount of constraints. In the expected wind energy development area, management for soils, wildlife seasonal periods, and paleontological and visual resources result in constraints on location, timing, and project design. In the utility ROW corridors, management for soils and wildlife seasonal periods would result in constraints on location and timing.

Overall, there would be a moderate increase in the level of constraint on land use authorizations.

Impacts from Alternative II

Overall, Alternative II would have the second lowest amount of constraint having a minor impact on land use authorizations. Alternative II would have the lowest amount of ROW exclusion areas, similar to the

No Action Alternative. Alternative II would also have the second lowest amount of ROW avoidance areas, similar to Alternatives I, III, and IV. Alternative II would have similar types of constraints as Alternative I, but with fewer areas affected by wildlife seasonal restrictions and Visual Resource Management. As a result, there would be fewer constraints on timing and project design compared to Alternative I.

Alternative II would have the highest acreages available for wind energy development within two miles of lands rated fair or better for wind resources. Alternative II would have the highest acreages available for utility ROW corridors similar to Alternatives I, III, IV, and V. The expected wind energy development area would have the second highest level of constraint and the utility ROW corridors for Alternative II would have the lowest level of constraint. In the expected wind energy development area, management for soils, special status species, and paleontological and visual resources result in more constraints on location, timing, and project design for wind energy developments than in Alternative I. In the utility ROW corridors, there would be fewer constraints on soils and wildlife seasonal periods than in Alternative I.

Overall, there would be a minor increase in the level of constraint on land use authorizations.

Impacts from Alternative III

Overall, Alternative III would have the third lowest amount of constraint having a moderate impact on land use authorizations, similar to Alternative I. Alternative III would have the lowest amount of ROW exclusion areas, similar to the No Action Alternative and Alternatives I, II, and VI. Alternatives I and II, while having the third highest amount of ROW avoidance areas, similar to Alternatives I, II, and IV. Alternative III would have the same constraints on land use authorizations near sage-grouse leks as in Alternative I, but with fewer restrictions related to wildlife seasonal periods and visual resources. This would increase the constraint on location but reduce the constraint on timing as compared to Alternative I.

Alternative III would have the third highest acreages available for wind energy development within two miles of land rated fair of higher for wind resources. Alternative III would have the second highest acreages available for utility ROW corridors similar to Alternatives I, II, IV, and V. The expected wind energy development area for Alternative III would have the third highest amount of constraints, similar to Alternative II. Management for wildlife seasonal periods and visual resources would result in more constraints on timing and project design than in Alternative II, but Alternative III would have the same constraints due to distance from sage-grouse leks as Alternative I. In the utility ROW corridors, management for soils and wildlife seasonal periods would result in constraints on location and timing.

Overall, there would be a moderate increase in the level of constraint on land use authorizations.

Impacts from Alternative IV

Overall, Alternative IV would have the highest amount of constraint having a major impact on land use authorizations. Alternative IV would have the second highest amount of ROW exclusion areas, similar to Alternative V, while having the third highest amount of ROW avoidance areas, similar to Alternatives I, II, and III. Alternative IV would have the highest amount of constraint on distance from sage-grouse leks, soil resources, and wildlife seasonal periods. This would result in more constraint on location and timing than Alternative I.

Alternative IV would have the third lowest acreage available for wind energy development within two miles of land rated fair or better for wind resources; and the second highest acreages available for utility ROW corridors. In the expected wind energy development area, management for soil, wildlife seasonal periods, distance from sage-grouse leks, and paleontological resources would result in the third lowest constraint on location and timing for wind energy development than the alternatives. However, the utility ROW corridors for Alternative IV would have the highest level of constraint of all alternatives. In the utility ROW corridors, management for sage-grouse leks, soil resources, and wildlife seasonal periods results in highest constraint on location and timing than in the other alternatives.

Overall, there would be a major increase in the level of constraint on land use authorizations.

Impacts from Alternative V

Overall, Alternative V would have the second highest amount of constraint having a major impact on land use authorizations. Alternative V would have the highest amount of ROW exclusion areas, the second highest amount of ROW avoidance areas, and the highest amount of constraint on distance from sage-grouse leks, soil resources, and visual resources.

Alternative V would have the second lowest acreages available for wind energy development within two miles of land rated fair or better for wind resources. Alternative V would have the highest acreages available for utility ROW corridors similar to Alternatives I, II, III; and IV and would have similar acres of constraint as Alternative IV. The expected wind energy development area does not contain any sage-grouse habitat. This lack of constraint on sage-grouse leks and wildlife seasonal periods results in fewer constraints on location and timing than in Alternative IV. However, the utility ROW corridors for Alternative V would have the third highest level of constraint. In the utility ROW corridors, fewer constraints on wildlife seasonal periods would result in fewer constraints on timing than in Alternative IV.

Overall, there would be a major increase in the level of constraints on land use authorizations.

Impacts from Alternative VI (Proposed RMP)

Overall, Alternative VI would have the third highest amount of constraint having a major impact on land use authorizations. Alternative VI would have the lowest amount of ROW exclusion areas, similar to the No Action Alternative and Alternatives I, II, and III. Alternative VI would also have more constraints on land use authorizations near sage-grouse leks than the No Action Alternative and in Alternatives I, II, and III and the highest amount of constraint on soil resources and wildlife seasonal periods than the other alternatives.

Alternative VI would have the lowest acreage available for wind energy development within two miles of land rated fair or better for wind resources. Alternative VI would have the lowest acreages available for utility ROW corridors except for the No Action Alternative. In the expected wind energy development area, Alternative VI would have the lowest level of constraints similar to the No Action Alternative. Management for soil resources, wildlife seasonal periods, distance from sage-grouse leks, and paleontological resources would result in the second highest constraint on location and timing than in the other alternatives. However, the utility ROW corridors for Alternative VI would have the third lowest level of constraint of the alternatives.

Overall, there would be a major increase in the level of constraint on land use authorizations.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impacts analysis area for land use authorizations includes all lands within the planning area; approximately 1,800,000 acres. The cumulative impacts analysis considers past, present, and reasonably foreseeable actions within the planning area that would increase or decrease the amount of constraint on land use authorizations.

Past, present, and reasonably foreseeable actions for the following resource use cumulatively affects land use authorizations:

- Land Use Authorizations.

In addition to the description of these actions in the *Introduction* to this chapter, future land use authorizations in the planning area would be somewhat constrained by existing projects. For example, there are already over 4,000 miles of various types of routes within the planning area; 10% of these miles are part of over 50 grants for roads. As a result, new road rights-of-way (ROWs) in these areas would only be granted if they would be compatible with the existing grants. Also, several of the utility ROW corridors identified in the alternatives already contain phone lines, powerlines, or gas pipelines (e.g., Williams Northwest Pipeline and Chevron natural gas pipelines); these would constrain the location of

future ROWs in the utility ROW corridors, depending on the degree to which the existing and future ROWs are compatible. Other existing powerlines and several small, privately owned wind farms in the analysis area, as well as the Gateway West Transmission Line Project and the proposed China Mountain Wind Energy Project (which is currently on hold pending the decision of the Final EIS) would also constrain the location of future ROWs.

There are 115,000 acres of lands managed by the Department of Defense in the planning area; 4,000 acres are within two miles of lands rated fair or better for wind resource potential, while none are within the utility ROW corridors. For the purposes of analysis, it is assumed that wind energy and utility projects would be incompatible with the purposes for which these lands are managed and that these lands are unavailable for land use authorizations.

There are 4,000 acres of lands managed by the National Park Service in the planning area as the Hagerman Fossil Beds National Monument; 4,000 acres are within two miles of lands rated fair or better for wind resource potential, while fewer than 100 acres are within the utility ROW corridors. Law, regulation, and policy would make it unlikely that new land use authorizations for roads, utility lines, and wind energy could occur within the National Monument (Wissenbach, 2009). Therefore, for the purposes of analysis, it is assumed that these lands are unavailable for land use authorizations.

There are 78,000 acres of State lands managed by Idaho Department of Lands (IDL) in the planning area; 13,000 acres are within two miles of lands rated fair or better for wind resource potential, while 3,000 acres are within the utility ROW corridors. State lands are managed to generate revenue for nine endowment beneficiaries; the endowment beneficiary for the majority of State lands in the planning area is public schools (Kriwox, 2009). IDL is developing a wind lease template and a request for proposal for wind energy development to facilitate the leasing of State lands for wind energy (IDL, 2009a). State lands are also available for other types of developments as well, either through lease or sale of easements (Kriwox, 2009). Based on this, for the purposes of this analysis, it is assumed that State lands would generally be available for wind energy development, utility line development, and other types of land use authorizations and would generally present few constraints for such projects.

There are 241,000 acres of private lands in the planning area; 96,000 acres are within two miles of lands rated fair or better for wind resource potential, while 26,000 acres are within the utility ROW corridors. Private landowners may or may not place some type of restriction or constraint on land use authorizations on their lands; however, the type and extent of those restrictions are unknown. For the purposes of analysis, it is assumed that private landowners are likely to impose at least some level of restriction on land use authorizations and therefore, that private lands are available for land use authorizations with constraints.

Table 4-361 describes the constraints on land use authorizations on non-BLM lands within the utility ROW corridors and areas within two miles of lands rated fair or higher for wind resource potential. It is assumed that, 18% of non-BLM lands in the planning area are available for land use authorizations, 55% are available with constraints, and 27% are unavailable. On lands in the utility ROW corridors, 10% of non-BLM lands are available for utility line ROWs, 90% are available with constraints, and less than 1% are unavailable. In areas within two miles of lands rated fair or better for wind resource potential, 11% of non-BLM lands are available for wind energy ROWs, 82% are available with constraints, and 7% are unavailable.

Table 4-361. Constraints on Land Use Authorizations on Non-BLM Lands in the Planning Area (Acres)

Ownership	Acres	Available	Available with Constraints	Unavailable
On Lands in the Entire Planning Area				
Military	115,000	0	0	115,000
National Park Service	4,000	0	0	4,000
State of Idaho	78,000	78,000	0	0

Ownership	Acres	Available	Available with Constraints	Unavailable
On Lands in the Entire Planning Area				
Private	241,000	0	241,000	0
Total	**438,000**	**78,000**	**241,000**	**119,000**
On Lands in the High-Interest Areas for Utility Line Development				
Military	0	0	0	0
National Park Service	100	0	0	100
State of Idaho	3,000	3,000	0	0
Private	26,000	0	26,000	0
Total	**29,000**	**3,000**	**26,000**	**100**
In Areas Within 2 Miles of Lands Rated Fair or Higher for Wind Resource Potential				
Military	4,000	0	0	4,000
National Park Service	4,000	0	0	4,000
State of Idaho	13,000	13,000	0	0
Private	96,000	0	96,000	0
Total	**117,000**	**13,000**	**96,000**	**8,000**

Summary of Cumulative Impacts

For the purpose of the cumulative impact analysis in the planning area as a whole, acres available with at least one constraint are the overall footprint acres. Acres unavailable reflect right-of-way (ROW) exclusion areas. Areas available are the difference between the total planning area acres and the sum of acres available with constraints and acres unavailable.

To assess cumulative impacts in areas most suitable for wind energy development, acres available with constraints are the acres of expected wind energy development area with at least one constraint, identified in Table 4-350. To obtain acres unavailable, acres of expected wind development area for each alternative were subtracted from acres within 2 miles of lands rated fair or better for wind energy. To obtain acres available, acres available with constraints were subtracted from the acres of expected wind development area.

To assess cumulative impacts in areas most suitable for utility line development, acres available with constraints are the acres of utility ROW corridors with at least one constraint, identified in Table 4-351. To obtain acres unavailable, acres of utility ROW corridors for each alternative were subtracted from acres in the high-interest areas for utility line development. To obtain acres available, acres available with constraints were subtracted from the acres of utility ROW corridors.

Table 4-362. Areas Available in the Cumulative Impact Analysis Area for Land Use Authorizations by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
Available							
BLM	339,000	370,000	370,000	370,000	335,000	145,000	138,000
Other	78,000	78,000	78,000	78,000	78,000	78,000	78,000
Total	**416,000**	**447,000**	**447,000**	**447,000**	**412,000**	**222,000**	**215,000**
Available with Constraints							
BLM	935,000	1,001,000	1,001,000	1,001,000	1,001,000	1,227,000	1,232,000
Other	241,000	241,000	241,000	241,000	241,000	241,000	241,000
Total	**1,179,000**	**1,245,000**	**1,245,000**	**1,245,000**	**1,245,000**	**1,471,000**	**1,475,000**

	Alternative						
	No Action	I	II	III	IV	V	VI
Unavailable							
BLM	62,000	63,000	62,000	63,000	100,000	167,000	63,000
Other	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Total	**182,000**	**183,000**	**183,000**	**183,000**	**220,000**	**287,000**	**183,000**

Table 4-363. Areas Available in the Cumulative Impact Analysis Area for Wind Energy Rights-of-Way within Two Miles of Lands Rated Fair or Better for Expected Wind Energy Development by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
Available							
BLM	315,000	158,000	370,000	174,000	131,000	102,000	112,000
Other	13,000	13,000	13,000	13,000	13,000	13,000	13,000
Total	**328,000**	**171,000**	**383,000**	**187,000**	**144,000**	**115,000**	**125,000**
Available with Constraints							
BLM	172,000	77,000	223,000	88,000	75,000	73,000	77,000
Other	96,000	96,000	96,000	96,000	96,000	96,000	96,000
Total	**268,000**	**173,000**	**319,000**	**184,000**	**171,000**	**169,000**	**173,000**

Table 4-364. Areas Available in the Cumulative Impact Analysis Area for Utility Right-of-Way Corridors by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
Available							
BLM	30,000	53,000	53,000	53,000	53,000	53,000	43,000
Other	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Total	**33,000**	**56,000**	**56,000**	**56,000**	**56,000**	**56,000**	**46,000**

Cumulative Impacts from the No Action Alternative

In the No Action Alternative, 23% of the cumulative impacts analysis area would be available for land use authorizations, 67% would be available with constraints, and 10% would be unavailable; this would decrease the overall level of constraint on land use authorizations in the region.

In the No Action Alternative, 86% of the areas within two miles of lands rated fair or better for wind resource potential would be available for wind energy development, 70% would be available with constraints, and 14% would be unavailable. In the No Action Alternative, the high interest areas total about 33,000 acres (59%), of the highest potential to be developed within the utility ROW corridors. The implementation of the management in the Energy Corridor Record of Decision (ROD) (BLM, 2009a) would also decrease the amount of constraint on utility line development.

Cumulative Impacts from Alternative I

In Alternative I, 25% of the cumulative impacts analysis area would be available for land use authorizations, 69% would be available with constraints, and 10% would be unavailable; this would decrease the overall level of constraint on land use authorizations in the cumulative impact analysis area, but not as much as the No Action Alternative.

In Alternative I, 45% of the areas within two miles of lands rated fair or better for wind resource potential would be available for wind energy development, 45% would be available with constraints, and 55% would be unavailable. This would increase the overall level of constraint on land use authorizations for wind energy development in the cumulative impact analysis area by increasing the proportion of unavailable lands and decreasing the proportion available without constraints. The increase in unavailable areas on public lands would effectively make unavailable adjacent State or private lands, as it may become uneconomical to develop wind energy on those State or private lands. The extent of this impact would depend on the specific location and project proposed.

In Alternative I, 56,000 acres (100%) of the lands in the high-interest areas for utility line development would be available for utility ROW corridors. This would not substantially change the overall level of constraint on land use authorizations for utility line development in the region. However, Alternative I would reduce constraints on corridors designated by the Energy Corridor ROD by being one mile wide, rather than the 3,500-foot width designated in the Energy Corridor ROD.

Cumulative Impacts from Alternative II

In Alternative II, 25% of the cumulative impacts analysis area would be available for land use authorizations, 69% would be available with constraints, and 10% would be unavailable; This would decrease the overall level of constraint on land use authorizations in the cumulative impacts analysis area more than Alternative I, but not as much as the No Action Alternative.

In Alternative II, 100% of the areas within two miles of lands rated fair or better for wind resource potential would be available for wind energy ROWs, 83% would be available with constraints, and none would be unavailable. This would increase the overall level of constraint on land use authorizations for wind energy development in the region by increasing the proportion of unavailable lands. The increase in unavailable areas on public lands would effectively make adjacent State or private lands unavailable, as it may become uneconomical to develop wind energy on those State or private lands. The extent of this impact would depend on the specific location and project proposed.

In Alternative II, 100% of the lands in the high-interest areas for utility line development would be available for utility ROW corridors. This would decrease the overall level of constraint on land use authorizations for utility line development in the cumulative impacts analysis area. This decrease would be larger as Alternative II would reduce constraints on corridors designated by the Energy Corridor ROD by being one mile wide, rather than the 3,500-foot width designated in the Energy Corridor ROD.

Cumulative Impacts from Alternative III

In Alternative III, 25% of the cumulative impacts analysis area would be available for land use authorizations, 69% would be available with constraints, and 10% would be unavailable; this would decrease the overall level of constraint on land use authorizations in the cumulative impacts analysis area, but not as much as the No Action Alternative and Alternatives I and II.

In Alternative III, 49% of the areas within two miles of lands rated fair or better for wind resource potential would be available for wind energy development, 48% would be available with constraints, and 51% would be unavailable. This would increase the overall level of constraint on land use authorizations for wind energy development in the cumulative impacts analysis area to a similar level as in Alternative I. The increase in unavailable areas on public lands would effectively make adjacent State or private lands unavailable, as it may become uneconomical to develop wind energy on those State or private lands. The extent of this impact would depend on the specific location and project proposed.

In Alternative III, 56,000 acres (100%) of the lands in the high-interest areas for utility line development would be available for utility ROW corridors.

Cumulative Impacts from Alternative IV

In Alternative IV, 23% of the cumulative impact analysis area would be available for land use authorizations, 69% would be available with constraints, and 12% would be unavailable. Even though

there would be fewer areas unavailable, Alternative IV as a whole would increase the overall level of constraint on land use authorizations in the region.

In Alternative IV, 38% of the areas within two miles of lands rated fair or better for wind resource potential would be available for wind energy development, 45% would be available with constraints, and 62% would be unavailable. This would increase the overall level of constraint on land use authorizations for wind energy development in the cumulative impacts analysis area to a similar level as in Alternatives I and III. The increase in unavailable areas on public lands would effectively make adjacent State or private lands unavailable, as it may become uneconomical to develop wind energy on those State or private lands. The extent of this impact would depend on the specific location and project proposed.

In Alternative IV, 56,000 acres (100%) of the lands in the high-interest areas for utility line development would be available for utility ROW corridors.

Cumulative Impacts from Alternative V

In Alternative V, 12% of the cumulative impact analysis area would be available for land use authorizations, 82% would be available with constraints, and 16% would be unavailable. Even though there would be fewer areas unavailable, Alternative V as a whole would increase the overall level of constraint on land use authorizations in the region, to a similar degree as Alternative IV.

In Alternative V, 30% of the areas within two miles of lands rated fair or higher for wind resource potential would be available for wind energy ROWs, 44% would be available with constraints, and 70% would be unavailable. This would increase the overall level of constraint on land use authorizations for wind energy development in the region the most of all alternatives by having the highest proportion of unavailable lands. The increase in unavailable areas on public lands would effectively make adjacent State or private lands unavailable, as it may become uneconomical to develop wind energy on those State or private lands. The extent of this impact would depend on the specific location and project proposed. In Alternative V, 56,000 acres (100%) of the lands in the high-interest areas for utility line development would be available for utility ROW corridors.

Cumulative Impacts from Alternative VI (Proposed RMP)

In Alternative VI, 12% of the cumulative impact analysis area would be available for land use authorizations, 82% would be available with constraints, and 10% would be unavailable. Even though there would be fewer areas unavailable, Alternative VI as a whole would increase the overall level of constraint on land use authorizations in the cumulative impact analysis area, to a similar degree as Alternative IV.

In Alternative VI, 33% of the areas within two miles of lands rated fair or higher for wind resource potential would be available for wind energy development, 45% would be available with constraints, and 67% would be unavailable. This would increase the overall level of constraint on land use authorizations for wind energy development in the cumulative impact analysis area the most of all alternatives by having a high proportion of unavailable lands. The increase in unavailable areas on public lands would effectively make adjacent State or private lands unavailable, as it may become uneconomical to develop wind energy on those State or private lands. The extent of this impact would depend on the specific location and project proposed.

In Alternative VI, 46,000 acres (82%) of the lands in the high-interest areas for utility line development would be available for utility ROW corridors. This would increase the overall level of constraint on land use authorizations for utility line development in the region.

4.4.5. Land Tenure

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to land tenure transactions:

- **Acres of public land available for land tenure transactions** (e.g., sales, exchanges, and agricultural entry, Desert Land Entry Act of 1877 [DLE] and/or the Carey Act of 1894 [CA]).

Methods and Assumptions

Impacts to land tenure from management in the *Land Tenure* section of Chapter 2 was analyzed in detail. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for land tenure. Impacts from management for land tenure can be found under *Impacts from Land Tenure Actions* in the *Tribal Rights and Interests,* Paleontological *Resources,* and *Wilderness* sections.

The acres of public land available for land tenure transactions was evaluated by determining the number of acres available by five transaction types: sale, exchange, Desert Land Entry Act of 1877 transactions, Carey Act of 1894 transactions, and Recreation and Public Purposes Act of 1954 (R&PP) leases and/or patents. The more acres available, the greater the public's ability to engage in that particular land tenure transaction.

The number of acres in each Land Tenure Zone was examined to determine whether acres within that zone could leave BLM management. Acreage in Land Tenure Zone 1 is considered a retention zone and cannot leave BLM management. Acreage in Land Tenure Zone 2 can be exchanged, but only for acres within the planning area containing high resource value lands, or offered as R&PP leases and/or patent, resulting in little to no net loss of BLM-managed acres within the planning area. Acres in Land Tenure Zone 3 can be sold, exchanged for acres outside the planning area, or offered as R&PP leases and/or patents resulting in a net loss of BLM-managed acres within the planning area.

Lands can be acquired by the BLM anywhere in the planning area. This does not vary by alternative and was not analyzed. Each land tenure adjustment proposal would be evaluated through the National Environmental Policy Act process prior to any land tenure transaction.

Direct and Indirect Impacts

Impacts from Land Tenure Actions

Table 4-365 contains the number of acres available for the transaction types in each alternative. The total acreage available for land tenure transactions is not a sum of the acres as a particular acre may be available for more than one transaction type.

Table 4-365. Areas Available by Type of Land Tenure Transaction by Alternative (Acres)

Land Tenure Transaction	Alternative						
	No Action	I	II	III	IV	V	VI
Sale	2,000	20,000	46,000	20,000	16,000	0	13,000
Exchange	243,000	243,000	349,000	243,000	219,000	89,000	32,000
DLE/CA[A]	67,000	960	960	960	960	960	960
R&PP Patent	1,371,000	243,000	349,000	243,000	219,000	89,000	32,000
Total Acres Available for Land Tenure Transactions [B]	**1,371,000**	**263,960**	**395,960**	**263,960**	**235,960**	**89,960**	**45,960**

[A] Desert Land Entry Act and/or Carey Act transactions.
[B] This total reflects the footprint for acres available for at least one type of land tenure transaction.

Table 4-366 contains the number of acres in each Land Tenure Zone for the action alternatives. The Land Tenure Zone determines whether public lands are emphasized for retention or can be considered for disposal. The No Action Alternative does not identify Land Tenure Zones.

Table 4-366. Land Tenure Zone by Alternative (Acres)

Land Tenure Zone	Alternative					
	I	II	III	IV	V	VI
1	1,108,000	977,000	1,108,000	1,137,000	1,282,000	1,326,000
2	243,000	349,000	243,000	219,000	89,000	32,000
3	20,000	46,000	20,000	16,000	0	13,000

Impacts from Management Specific to the No Action Alternative

The No Action Alternative allows for land tenure transactions in 99% of the planning area. While this is more acreage than any of the action alternatives, most of this is available for Desert Land Entry Act and/or Carey Act or Recreation and Public Purposes (R&PP) patents. With the exception of Alternative V, the No Action Alternative has the fewest acres available for sale. Nearly the entire planning area is available for Desert Land Entry Act and/or Carey Act or R&PP patents. In the No Action Alternative, 2,000 acres are available for sale or exchange.

Impacts from Management Common to All Action Alternatives

No new Desert Land Entry Act and/or Carey Act applications will be accepted. Current Desert Land Entry Act and/or Carey Act applications submitted prior to 2009 will be processed, and lands meeting the criteria of the Acts will be disposed of. The following are identified as current Desert Land Entry Act applications: IDI-7401, IDI-7402, IDI-27888, and IDI-27889. This would limit the availability of the public lands available for Desert Land Entry Act and/or Carey Act transactions compared to the No Action Alternative by reducing the number of acres available for Desert Land Entry Act and/or Carey Act by approximately 99%.

Impacts from Management Specific to Alternatives I and III

Alternatives I and III allow for at least one type of land tenure transaction in 19% of the planning area. Approximately 1% of the planning area is available for sale, potentially resulting in a net loss of BLM-managed acres. Approximately 18% is available for exchange, Desert Land Entry Act and/or Carey Act applications submitted prior to 2009, or R&PP patent, with little to no potential for net loss of BLM-managed acres.

Impacts from Management Specific to Alternative II

Alternative II allows for at least one type of land tenure transaction in 29% of the planning area. Approximately 3% of the planning area is available for sale, potentially resulting in a net loss of BLM-managed acres. Approximately 25% is available for exchange, Desert Land Entry Act and/or Carey Act applications submitted prior to 2009, or R&PP patent, with little to no potential for net loss of BLM-managed acres.

Impacts from Management Specific to Alternative IV

Alternative IV allows for at least one type of land tenure transaction in 17% of the planning area. Less than 1% of the planning area is available for sale, potentially resulting in a net loss of BLM-managed acres. Approximately 16% is available for exchange, Desert Land Entry Act and/or Carey Act applications submitted prior to 2009, or R&PP patent, with little to no potential for net loss of BLM-managed acres.

Impacts from Management Specific to Alternative V

Alternative V allows for at least one type of land tenure transaction in 7% of the planning area. None of the planning area is available for sale, while approximately 6% is available for exchange, Desert Land Entry Act and/or Carey Act applications submitted prior to 2009, or R&PP patent.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI allows for at least one type of land tenure transaction in 3% of the planning area. Less than 1% of the planning area is available for sale, while approximately 2% is available for exchange, Desert Land Entry Act and/or Carey Act applications submitted prior to 2009, or R&PP patent.

Summary of Direct and Indirect Impacts

Currently, 75% of the lands within the planning area are managed by the BLM (1,371,000 acres) and 25% are managed by other Federal agencies, State agencies, or private individuals (447,000 acres).

Impacts from the No Action Alternative

Under the No Action Alternative, 1,368,000 acres could leave BLM management. While this would be the largest change of any of the alternatives, due to the small percentage of public land leaving BLM management over the past 20 years, this is not expected to occur. Overall, there would be a negligible impact to the ability of the public to engage in a land tenure transaction.

Impacts from Alternatives I and III

Under Alternatives I and III, 243,000 acres could leave BLM management. Due to the low percentage of public land leaving BLM management in the planning area over the past 20 years, this is not expected to occur. While some acres in Zone 2 could leave BLM management through exchange, Recreation and Public Purposes Act (R&PP) patents, Desert Land Entry Act, and/or Carey Act applications submitted prior to 2009, based on past interest in these transactions, the number of acres that could be affected by these transactions over the life of the plan is negligible. Overall, there would be a minor beneficial impact to the public's availability to engage in a land tenure transaction.

Impacts from Alternative II

Under Alternative II, 348,000 acres could leave BLM management. Due to the low percentage of public land leaving BLM management in the planning area over the past 20 years, this is not expected to occur. While some acres in Zone 2 could leave BLM management through exchange, R&PP patents, Desert Land Entry Act, and/or Carey Act applications submitted prior to 2009, based on past interest in these transactions, the number of acres that could be affected by these transactions over the life of the plan is negligible. Of all the action alternatives, Alternative II has the most acres of public land available for land tenure transactions. Overall, there would be a minor beneficial impact to the public's ability to engage in land tenure transactions.

Impacts from Alternative IV

Under Alternative IV, 219,000 acres could leave BLM management. Due to the low percentage of public land leaving BLM management in the planning area over the past 20 years, this is not expected to occur. While some acres in Zone 2 could leave BLM management through exchange, R&PP patents, Desert Land Entry Act, and/or Carey Act applications submitted prior to 2009, based on past interest in these transactions, the number of acres that could be affected by these transactions over the life of the plan is negligible. Overall, there would be a minor impact to the availability of the public to engage in a land tenure transaction.

Impacts from Alternative V

Under Alternative V, 89,000 acres could leave BLM management. While some acres in Zone 2 could leave BLM management through exchange, R&PP patents, Desert Land Entry Act, and/or Carey Act applications submitted prior to 2009, based on past interest in these transactions, the number of acres that could be affected by these transactions over the life of the plan is negligible. Overall, there would be a negligible impact to the ability of the public to engage in a land tenure transaction.

Impacts from Alternative VI (Proposed RMP)

Under Alternative VI, 32,000 acres could leave BLM management. While some acres in Zone 2 could leave BLM management through exchange, R&PP patents, Desert Land Entry Act, and/or Carey Act applications submitted prior to 2009, based on past interest in these transactions, the number of acres

that could be affected by these transactions over the life of the plan is negligible. Overall, there would be a negligible impact to the availability of the public to engage in a land tenure transaction.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area for analysis of past, present, and reasonably foreseeable actions includes the BLM's Bruneau, Burley, Elko, and Shoshone Field Offices. These field offices were chosen because it was assumed that someone interested in conducting a land tenure transaction in southern Idaho or northern Nevada would consider land in any of the field offices adjacent to the planning area.

Past, present, and reasonably foreseeable actions for the following resource use cumulatively affects land tenure:

- Land Tenure.

These actions are described in the *Introduction* to this chapter. While it is difficult to know how many acres would leave BLM management under the different alternatives, it can be assumed that the low demand for land tenure transactions would continue.

Summary of Cumulative Impacts

To assess cumulative impacts, the acres available in the region for each type of land tenure transaction by alternative are identified. The number of acres available for land tenure transactions in adjacent BLM field offices are displayed is Table 4-367.

Table 4-367. Areas Available for Land Tenure Transactions in the Cumulative Impact Analysis Area (Acres)

Field Office	BLM-Managed Acres	Sale	Exchange	R&PP Patent
Bruneau	1,400,000	55,000	55,000	55,000
Burley	854,000	61,000	61,000	0
Elko	3,134,000	14,000	243,000	0
Shoshone	1,440,000	355,000	544,000	355,000
Jarbidge	1,371,000	2,000	243,000	1,371,000
Total	**8,199,000**	**487,000**	**1,146,000**	**1,781,000**

Table 4-368 displays the number of acres of BLM-managed lands available for each type of land tenure transaction in the adjacent field offices and under each alternative.

Table 4-368. Areas Available in the Cumulative Impact Analysis Area for Land Tenure Transactions by Alternative (Acres)

Land Tenure Transaction	Adjacent Field Offices	Alternative						
		No Action	I	II	III	IV	V	VI
Sale	485,000	2,000	20,000	46,000	20,000	16,000	0	13,000
Exchange	903,000	4,000	243,000	349,000	243,000	219,000	89,000	32,000
DLE/CA[A]	0	67,000	960	960	960	960	960	960
R&PP Patent	410,000	1,371,000	263,000	394,000	263,000	235,000	89,000	45,000

[A] Desert Land Entry Act and/or Carey Act transactions.

Cumulative Impacts from the No Action Alternative

Under the No Action Alternative, 487,000 acres of BLM-managed lands would be available for sale in the cumulative impact analysis area. This is similar to the action alternatives with 7% of BLM-managed lands available for sale. The No Action Alternative has the fewest (4,000 acres) BLM-managed lands available

for exchange. Within the cumulative impact analysis area, 907,000 acres are available, resulting in 11% of BLM-managed total lands available for exchange. While the No Action Alternative allows for the largest number of acres for the Desert Land Entry Act and/or the Carey Act, regionally, it still results in less than 1% of BLM-managed lands available under the Desert Land Entry Act and/or the Carey Act.

Cumulative Impacts from Alternatives I and III

Under Alternatives I and III, 505,000 acres of BLM-managed lands would be available for sale in the cumulative impact analysis area. This is similar to the No Action Alternative and the other action alternatives with 6% of BLM-managed lands available for sale. With 1,146,000 acres of BLM-managed lands in the cumulative impact analysis area available for exchange (14%), Alternatives I and III have similar number of acres of BLM-managed lands in the cumulative impact analysis area available for exchange and fewer acres available than Alternative II. While Alternatives I and III allow for a fewer number of acres for the Desert Land Entry Act and/or the Carey Act than the No Action Alternative, regionally, they result in the same percentage of BLM-managed lands available for the Desert Land Entry Act and/or the Carey Act (less than 1%) than the No Action Alternative and the other action alternatives. Alternatives I and III have 263,000 acres available for Recreation and Public Purposes Act (R&PP) patents or 8%, of BLM-managed lands in the cumulative impact analysis area would be available for R&PP patents.

Cumulative Impacts from Alternative II

Under Alternative II, 531,000 acres (6%) of BLM-managed lands would be available for sale in the cumulative impact analysis area. With 1,252,000 acres of BLM-managed lands in the cumulative impact analysis area available for exchange (15%), Alternative II has more acres of BLM-managed lands in the cumulative impact analysis area available for exchange than the other alternatives. While Alternative II allows for a fewer number of acres for the Desert Land Entry Act and/or the Carey Act than the No Action Alternative, regionally, it results in the same percentage of BLM-managed lands available for the Desert Land Entry Act and/or the Carey Act (less than 1%) than the other action alternatives. Alternative II has fewer acres of BLM-managed lands in the cumulative impact analysis area available for R&PP patents than the No Action Alternative, but more acres available then the other action alternatives; 804,000 acres, or 10%, would be available for R&PP patents in Alternative II.

Cumulative Impacts from Alternative IV

Under Alternative IV, 501,000 acres of BLM-managed lands would be available for sale in the cumulative impact analysis area. This is similar to the No Action Alternative and the other action alternatives with 6% of BLM-managed lands available for sale. With1,122,000 acres of BLM-managed lands in the cumulative impact analysis area available for exchange (14%), Alternative IV has a similar number of acres of BLM-managed lands in the region available for exchange as Alternatives I and III, more acres available than the No Action Alternative and Alternative V, and fewer acres available than Alternative II. While Alternative IV allows for a fewer number of acres for the Desert Land Entry Act and/or the Carey Act than the No Action Alternative, regionally, it results in the same percentage of BLM-managed lands available for the Desert Land Entry Act and/or the Carey Act (less than 1%) as the other action alternatives. Alternative IV has 645,000 acres (8%) available similar to the number of acres of BLM-managed lands in the cumulative impact analysis area available for the R&PP patents as Alternatives I and III, fewer acres than the No Action Alternative and Alternative II, and more acres available than Alternatives V and VI.

Cumulative Impacts from Alternative V

Under Alternative V, 485,000 acres of BLM-managed lands would be available for sale in the cumulative impact analysis area. This is similar to the No Action Alternative and the other action alternatives with 6% of BLM-managed lands available for sale. With 992,000 acres of BLM-managed lands in the cumulative impact analysis area available for exchange (12%), Alternative V has more acres available than Alternative VI, but fewer acres available than the other alternatives. While Alternative V allows for fewer acres for the Desert Land Entry Act and/or the Carey Act than the No Action Alternative, regionally, it results in the same percentage of BLM-managed lands available for the Desert Land Entry Act and/or the Carey Act (less than 1%) as the other action alternatives. Alternative V has a fewer number of acres of BLM-managed lands in the cumulative impact analysis area available for R&PP patents than the other

alternatives except for Alternative VI; 499,000 acres, or 6%, of BLM-managed lands in the cumulative impact analysis area would be available for R&PP patents in Alternative V.

Cumulative Impacts from Alternative VI (Proposed RMP)

Under Alternative IV, 498,000 acres of BLM-managed lands would be available for sale in the cumulative impact analysis area. This is similar to the No Action Alternative and the other action alternatives with 6% of BLM-managed lands available for sale. With 935,000 acres of BLM-managed lands in the cumulative impact analysis area available for exchange (11%), Alternative VI has a similar number of acres of BLM-managed lands in the cumulative impact analysis area available for exchange as Alternatives I and III have more acres available than the No Action Alternative and Alternative V, and fewer acres available than Alternative II. Alternative VI has 455,000 acres (6%) of BLM-managed lands in the cumulative impact analysis area available for R&PP patents similar to Alternative V.

4.4.6. Minerals

4.4.6.1. Leasable Minerals

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to mineral leasing:

- **Amount of constraint on mineral leasing** – The primary factor within the alternatives that would affect mineral leasing is the amount of constraint the alternative would place on this use. This indicator reflects the availability of BLM-managed lands for leasable mineral exploration and development.

Even though there is no surface disturbing activity approved when a lease is issued, mineral leasing itself is considered an irreversible commitment of resources that requires the preparation of an EIS. The EIS prepared with an RMP is intended to satisfy NEPA requirements for issuing fluid mineral leases. A determination of where and under what conditions fluid mineral exploration, development, and utilization activities can occur without harming other resources is made in an RMP. This determination is the basis for the timing, surface use, and no surface occupancy (NSO) stipulations that are attached to a federal oil and gas or geothermal lease. The amount of constraint on mineral leasing in a particular area can vary widely, depending on the need to mitigate impacts to other resources or uses in that area. An area may be closed to mineral leasing entirely if other resources or uses cannot be adequately protected from leasable mineral development with even the most restrictive lease stipulations; this would render any mineral deposit in that area inaccessible over the life of the plan. In contrast, an area with few resource or use conflicts may be open to mineral leasing subject to existing laws, regulations, and formal orders; the terms and conditions of the standard lease form; and stipulations for Endangered Species Act (ESA) Section 7 Consultation and Cultural Resource Protection. Between these lay various degrees of other constraints including NSO and seasonal and controlled surface use restrictions for areas where such restrictions may be required to mitigate impacts to other resource values. Management for other resources within the planning area can also affect leasable mineral exploration and development. In general, management direction that restricts leasable mineral exploration and development would tend to add cost and delay while also increasing the complexity of permitting and the logistical operation of these activities.

Leasable minerals include oil, gas, and geothermal phosphate. These minerals are leasable on both Public Domain and acquired lands. If deposits are known to exist and to be economically workable, leases are sold competitively. If deposits are not known, a prospecting permit can be obtained on a first-come, first-served basis, which allows the permittee to explore for the mineral.

Methods and Assumptions

Impacts to mineral leasing from management in the following sections of Chapter 2 were analyzed in detail: *Leasable Minerals*, *Soil Resources*, *Special Status Species*, *Paleontological Resources*, and *Visual Resources*. Impacts from management in the *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Cultural Resources*, *Lands with Wilderness Characteristics*, *Areas of Critical Environmental Concern*, *National Historic Trails*, *Wilderness*, *Wild and Scenic Rivers*, and *Wilderness Study Areas* sections were not analyzed in detail because the impacts were captured in the analysis of leasable minerals actions. Impacts from management in the remaining sections were not analyzed in detail because the management would not noticeably affect mineral leasing. Impacts from management for leasable minerals can be found under *Impacts from Minerals Actions* in the *Climate Change*, *Soil Resources*, *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Wild Horses*, *Paleontological Resources*, *Cultural Resources*, *Lands with Wilderness Characteristics*, *Livestock Grazing*, and *Wild and Scenic Rivers* sections.

The amount of constraint on mineral leasing in each alternative was quantified through a Geographic Information System analysis of the various leasable mineral allocations described in Chapter 2. Through this analysis, the number and types of constraints were determined for each acre of BLM-managed lands within the planning area (1,371,000 acres). The number and types of constraints were also determined for the areas with potential for oil and gas leasing (307,000 acres; Map 114) identified in the *Reasonably Foreseeable Development Scenario for Oil and Gas Development in the Jarbidge Field Office* (Appendix K) and the areas with high (9,000 acres) and medium (357,000 acres) potential for geothermal leasing (Map 115) identified in the *Reasonably Foreseeable Development Scenario for Geothermal Development in the Jarbidge Field Office* (Appendix L).[11]

The resulting combinations of constraints were arranged into a hierarchy that represents varying levels of constraint. The hierarchy was based on the availability of lands for leasing and for areas where leasing is permitted, the relative difficulty and cost of conducting exploration and development operations. The hierarchy is ordered from “No Leasing” (most constrained) to “Leasing with Standard Lease Terms” (least constrained) as follows:

- **Category 1: No Leasing**– Lands that are withheld from leasing based on discretionary decisions made by the BLM or cannot be leased due to statute; this category includes the Bruneau-Jarbidge Rivers Wilderness and lands described in Chapter 2 as being closed to mineral leasing.
- **Category 2: Leasing, NSO** – Lands that can be leased, but surface-disturbing exploration and development activities are prohibited. These stipulations protect identified resources such as the Oregon National Historic Trail, the Kelton and Toana Freight Roads, and eligible, suitable, and designated Wild and Scenic Rivers as described in Chapter 2.
- **Category 3: Leasing, Cumulative Timing Limitations greater than nine months** – Lands that can be leased, but stipulations limit the time of the year when exploration, construction, and drilling can take place during more than nine months of the year. Timing limitations prohibit surface use during specified time intervals to protect identified resources, including sage-grouse, big game, redband trout, and bull trout. Some Category 3 lands may have the controlled surface use stipulation for Riparian Conservation Areas (RCAs) in addition to the timing limitation.
- **Category 4: Leasing, Cumulative Timing Limitations greater than six to less than or equal to nine months** – Lands that can be leased, but stipulations limit the time of the year when exploration, construction, and drilling can take place between six and nine months of the year. Some Category 4 lands may have the controlled surface use stipulation for RCAs in addition to the timing limitation.
- **Category 5: Leasing, Cumulative Timing Limitations greater than three to less than or equal to six months** – Lands that can be leased, but stipulations limit the time of the year when exploration, construction, and drilling can take place between three and six months of the year. Some Category 5 lands may have the controlled surface use stipulation for RCAs in addition to the timing limitation.

[11] Areas with high and medium potential for geothermal leasing are analyzed together due to the relatively small acreage with high potential.

- **Category 6: Leasing, Cumulative Timing Limitations less than or equal to three months** – Lands that can be leased, but stipulations limit the time of the year when exploration, construction, and drilling can take place during less than three months of the year. Some Category 6 lands may have the controlled surface use stipulation for RCAs in addition to the timing limitation.
- **Category 7: Leasing, Controlled Surface Use** – Lands where stipulations control implementation of specific exploration and development activities; in this RMP, the controlled surface use stipulation applies to RCAs. Category 7 is comprised of areas with a controlled surface use stipulation that do not also have a timing limitation.
- **Category 8: Leasing, Standard Lease Terms** – Lands that can be leased subject to existing laws, regulations, and formal orders; the terms and conditions of the standard lease form; and stipulations for ESA Section 7 Consultation and Cultural Resource Protection.

The leasable mineral allocations in the No Action Alternative are not comparable to those in the action alternatives because the acres within some categories overlap and the constrained areas were not mapped. As a result, additional steps were necessary to analyze impacts of the leasable minerals actions in the No Action Alternative. The acres allocated as open, NSO, and closed for each multiple use area (MUA) exceeded the total acres of each MUA; to obtain numbers for analysis, the most restrictive interpretation of these allocations was taken. For instance, where limited and closed acres in an MUA were identical, those acres were assumed to be closed; where the limited acres were clearly accounted for as part of open, those acres were assumed to be limited and were subtracted from open. Acres within 500 feet of perennial and intermittent streams were subtracted from open areas and added to NSO areas. To obtain acres with seasonal restrictions, the acres of crucial mule deer and pronghorn winter range (Map 17) and acres within two miles of sage-grouse leks were subtracted from open areas. Acres identified in the 1987 Jarbidge RMP were adjusted proportionally to reflect the acres of BLM-managed lands in each MUA. This process was repeated to obtain acres under each level of constraint within the potential oil and gas and potential geothermal areas. The figures obtained from these calculations are intended only to assist with the analysis and comparison of the No Action Alternative with the action alternatives.

Where possible, the impacts of management identified for soils, special status species, paleontological resources, and visual resources were quantified through a Geographic Information System analysis; however, some management was only analyzed qualitatively. In these cases, impacts are characterized as increasing or decreasing the amount of constraint on mineral leasing.

Assumptions should not be construed to confine or redefine management contained within alternatives and were used to allow a comparison of impacts to mineral leasing resulting from the alternatives. Assumptions used to analyze impacts to mineral leasing include the following:

- Leasable minerals management applies to mineral leasing on BLM-managed lands. Management identified for soils, special status species, paleontological resources, and visual resources only applies to mineral leasing on lands with BLM surface management.
- Leasable minerals on lands in Category 1 are generally inaccessible; leasable minerals on lands in Categories 2 through 7 are accessible with restrictions beyond standard lease terms; and leasable minerals on lands in Category 8 are accessible under standard lease terms.
- A given interval of timing limitation reflects a similar level of constraint on mineral leasing with or without the controlled surface use stipulation for RCAs.
- Because exception, waiver, and modification criteria can only be analyzed on a site-specific basis, these criteria were assumed to not apply. However, any exceptions, waivers, and modifications to lease stipulations authorized would tend to reduce the impacts to development and increase the value of a lease.
- According to the *Reasonably Foreseeable Development Scenario for Oil and Gas Development in the Jarbidge Field Office* (Appendix K):
    - The most likely locations for oil and gas exploration and development are the northeast corner of the planning area and the Cedar Creek/China Mountain area (Map 114); these areas are referred to as the potential oil and gas areas.

  - Two or three geophysical exploration programs would be conducted to help identify potential exploration drilling targets. These would likely be conducted along existing roads or trails or by overland travel, thereby causing minor impacts to surface resources.
  - Approximately 10 to 20 oil and gas leases would be offered between now and 2032. Most of these would not progress to exploration or development operations, but one or two exploration wells may be drilled on some of those leases. On average, each well site would disturb approximately 15 acres due to construction of a drill pad and access roads, for a total of approximately 30 acres of temporary disturbance. It is anticipated that all of those acres would be reclaimed. Each drilling site would be active for approximately one year, from the start of drill pad and access road construction; through drilling and well testing; to completion of plugging the hole and reclamation.
  - One oil and gas well would encounter hydrocarbons in sufficient quantities to warrant field development. Based on this discovery, a five-well field would be developed; it may take one to three years to fully develop the field. Disturbance for additional roads, drill pads, pipelines, and storage tanks would total approximately 60 acres. It is anticipated that all of those acres would be reclaimed in the long term, after production activities are completed, which may take one to ten years depending on field characteristics.
  - The probability of full oil and gas field development and production occurring in the planning area during the next 20 years is considered low. Other oil and gas resources exist in Nevada, Utah, and Wyoming. Pipelines and other transportation infrastructure are in place in other locations, but not in the planning area; it is likely that most oil and gas production would occur from the known areas where infrastructure exists for oil and gas production.
- According to the *Reasonably Foreseeable Development Scenario for Geothermal Development in the Jarbidge Field Office* (Appendix L):
  - The most likely location for geothermal exploration and development is the area near Bruneau Hot Springs, determined to have high potential for geothermal resources, but the area designated as having medium potential (northern third of the planning area) may encounter exploration activities and possible development as well (Map 115); these areas with high and medium potential are referred to as potential geothermal areas.
  - Several geothermal exploration proposals would be processed between now and 2032 to explore for evidence of geothermal resources; a geothermal lease is not required for these activities. Geophysical surveying would likely be conducted along existing roads or trails, thereby causing negligible impacts to surface resources. Exploration would also likely include drilling of 20 temperature gradient wells. Temperature gradient well drilling takes from several days to several weeks per well. On average, each well site would disturb approximately 4.25 acres due to site preparation and access roads, for a total of approximately 85 acres of temporary disturbance. It is anticipated that all of those acres would be reclaimed.
  - One of the geothermal exploration activities would encounter geothermal resources in sufficient quantities to transition to a development/production phase; a typical development generally requires several leases. Based on the geothermal potential in the planning area, a 20-megawatt power plant would be developed with five production wells and five injection wells concentrated within a nine to 15 square mile area. It takes approximately one month to drill one well. Disturbance for additional roads, drill pads, pipelines, transmission lines, and the power plant would total approximately 100 to 145 acres. It is anticipated that all of those acres would be reclaimed in the long term, after production activities are completed, which may take 10 to 50 years depending on field characteristics.
  - The probability of full geothermal resource development and production occurring in the planning area during the next 20 years is higher than for oil and gas development but still considered low.
- Management for areas with very high potential for paleontological resources (Potential Fossil Yield Classification Class 5) would place more constraint on mineral leasing than areas with lower potential for paleontological resources.
- Management for areas within Visual Resource Management (VRM) Classes I and II would place more constraint on mineral leasing than management for areas within VRM Classes III and IV.
- Mitigation measures would increase costs and reduce the profitability of operations. In many cases, these would be considered typical costs of doing business on public lands. However, any increase in cost would potentially impact leasable mineral development. Higher costs may increase the sales

prices that operators charge purchasers, may limit mineral development to only the more profitable portions of a mineral deposit, or may reduce the overall amount of exploration and development. In some cases, increased costs would cause a particular proposal to not be economically feasible; and development actions may be dropped.

Direct and Indirect Impacts

Impacts from Leasable Minerals Actions

Table 4-369 through Table 4-375 summarize the impacts of the leasable minerals actions on mineral leasing. Overall, mineral leasing in the planning area would be most constrained in Alternatives VI, IV-A, IV-B, and I and the No Action Alternative, followed by Alternative V. Within the potential oil and gas areas, Alternatives I, IV, and VI would have the most constraint on mineral leasing, followed by the No Action Alternative and Alternative V. Within the potential geothermal areas, the No Action Alternative would have the most constraint on mineral leasing, followed by Alternatives VI, I, and V, then Alternative IV. Within all three geographic areas (i.e., planning area, potential oil and gas areas, and potential geothermal areas), Alternatives II and III would have the least constraint on mineral leasing.

Leasable minerals on Category 1 lands are considered inaccessible.

In an activity is proposed on a lease on Category 2 lands, it is likely that directional drilling and geophysical testing from adjacent lands would allow for adequate exploration and development to occur. Therefore, the underlying resource on Category 2 lands is considered accessible even though the surface above it cannot be occupied by drilling equipment. However, directional drilling is more expensive and has a lower success rate than conventional drilling. Forcing a lessee to use directional drilling by applying a no surface occupancy (NSO) stipulation would result in less-than-optimal utilization of the leasable mineral resource. NSO stipulations would decrease the lease value and, to a lesser extent, require the relocation of well sites and the modification of field development. NSO stipulations would tend to have the effect of adding to existing risk of finding and developing leasable minerals. This would tend to reduce interest in leasing minerals where an NSO stipulation is applied. Less leasing would tend to reduce leasable mineral exploration and development.

Leases issued with less major constraints, such as timing or controlled surface use restrictions, would result in similar impacts as leases issued with an NSO stipulation. Increased timing limitations generally result in increased delays for exploration, construction, and drilling, which increase costs and reduce profitability. The window for conducting mineral exploration would be quite short in some areas due to a combination of multiple timing restrictions and the heavy snows and intense winters sometimes experienced in southern Idaho. These restrictions applied to leasable mineral exploration activities may limit ability of lessees or permittees to obtain geologic information in a single season and would result in minerals and energy exploration programs being extended to two or more years. This would extend the length of time required to evaluate feasibility and prepare a development proposal.

The leasing stipulations in Chapter 2 are programmatic for the planning area. They address basic requirements that apply to conducting surface disturbance such as exploring and developing the lease. They do not address the many necessary site-specific protection and mitigation measures needed for approval of an environmentally sound operations plan. Mitigation measures appropriate for a specific site and operations plan would be developed and applied during a future BLM review and approval of individual plans of development, rights-of-way, sundry notices, and operating plans. The measures would be developed and assessed in a site-specific NEPA document that would be provided for public review at that time.

Impacts from Management Specific to the No Action Alternative

The mineral leasing allocations specific to the No Action Alternative would result in 8% of BLM-managed lands within the planning area being inaccessible for leasable mineral exploration and development. Approximately 53% of BLM-managed lands would be accessible with restrictions such as NSO and seasonal restrictions in sage-grouse habitat and big game winter range. The remaining 39% of the mineral area would be accessible under standard lease terms.

Within the potential oil and gas areas, 6% would be inaccessible for leasable mineral exploration and development, 33% would be accessible with restrictions beyond standard lease terms, and the remaining 61% would be accessible under standard lease terms. Within the potential geothermal areas, 7% would be inaccessible for leasable mineral exploration and development, 14% would be accessible with restrictions beyond standard lease terms, and the remaining 79% would be accessible under standard lease terms.

Table 4-369. Constraints on Leasable Mineral Development in the No Action Alternative (Acres)

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
1. No Leasing	112,000	18,000	24,000
2. Leasing, No Surface Occupancy	139,000	41,000	25,000
3. Leasing, Cumulative Timing Limitations > 9 Months	0	0	0
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9 Months	115,000	35,000	0
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6 Months	55,000	7,000	0
6. Leasing, Cumulative Timing Limitations ≤ 3 Months	411,000	18,000	28,000
7. Leasing, Controlled Surface Use Only	0	0	0
8. Leasing, Standard Lease Terms	539,000	188,000	289,000

[A] Categories are arranged in decreasing levels of constraint.

Mineral leases may be further constrained by site-specific lease stipulations to protect resources, which would be identified on a case-by-case basis.

Impacts from Management Common to All Action Alternatives

Under all action alternatives, the standard lease terms and the stipulations for Endangered Species Act (ESA) Section 7 Consultation and Cultural Resource Protection would apply, resulting in a baseline level of constraint that would apply to any future mineral leases. In addition, mineral leases may be further constrained by site-specific resource condition objectives, lease stipulations, conditions of approval, and actions to achieve those objectives, which would be identified on a case-by-case basis.

Impacts from Management Specific to Alternative I

The mineral leasing allocations specific to Alternative I would result in 11% of the planning area being inaccessible for leasable mineral exploration and development. Approximately 60% of the planning area would be accessible with constraints such as NSO; seasonal restrictions in key sage-grouse habitat, big game winter range, and spawning habitat for bull trout and redband trout; and controlled surface use restrictions for Riparian Conservation Areas (RCAs); 29% of the planning area would be accessible under standard lease terms.

Within the potential oil and gas areas, approximately 4% would be inaccessible for leasable mineral exploration and development, approximately 36% would be accessible with restrictions beyond standard lease terms, and the remaining 60% would be accessible under standard lease terms. Within the potential geothermal areas, approximately 4% would be inaccessible for leasable mineral exploration and development, approximately 7% would be accessible with restrictions beyond standard lease terms, and the remaining 89% would be accessible under standard lease terms.

Table 4-370. Constraints on Leasable Mineral Development in Alternative I (Acres)

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
1. No Leasing	151,000	11,000	14,000
2. Leasing, No Surface Occupancy	25,000	19,000	17,000
3. Leasing, Cumulative Timing Limitations > 9 Months [B]	0	0	0

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9	225,000	19,000	100
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6	557,000	70,000	7,000
6. Leasing, Cumulative Timing Limitations ≤ 3	5,000	2,000	300
7. Leasing, Controlled Surface Use Only	5,000	400	500
8. Leasing, Standard Lease Terms	403,000	185,000	327,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Some acres in Categories 4 through 7 may also have a controlled surface use stipulation for RCAs.

Impacts from Management Specific to Alternative II

The mineral leasing allocations specific to Alternative II would result in 5% of the planning area being inaccessible for leasable mineral exploration and development. Approximately 2% of the planning area would be accessible with NSO restrictions and controlled surface use restrictions for RCAs; 93% of the planning area would be accessible under standard lease terms.

Within the potential oil and gas areas, less than 1% of the area would be inaccessible for leasable mineral exploration and development, approximately 6% would be accessible with restrictions beyond standard lease terms, and the remaining 94% would be accessible under standard lease terms. Within the potential geothermal areas, less than 1% of the area would be inaccessible for leasable mineral exploration and development, approximately 4% would be accessible with restrictions beyond standard lease terms, and the remaining 95% would be accessible under standard lease terms.

Table 4-371. Constraints on Leasable Mineral Development in Alternative II (Acres)

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
1. No Leasing	62,000	100	700
2. Leasing, No Surface Occupancy	25,000	14,000	13,000
3. Leasing, Cumulative Timing Limitations > 9[B]	0	0	0
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9	0	0	0
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6	0	0	0
6. Leasing, Cumulative Timing Limitations ≤ 3	0	0	0
7. Leasing, Controlled Surface Use Only	8,000	4,000	3,000
8. Leasing, Standard Lease Terms	1,277,000	288,000	349,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Some acres in Categories 4 through 7 may also have a controlled surface use stipulation for RCAs.

Impacts from Management Specific to Alternative III

The mineral leasing allocations specific to Alternative III would result in 6% of the planning area being inaccessible for leasable mineral exploration and development. Approximately 1% of the planning area would be accessible with NSO restrictions and controlled surface use restrictions for RCAs; 93% of the planning area would be accessible under standard lease terms.

Within the potential oil and gas areas, 2% would be inaccessible for leasable mineral exploration and development, approximately 4% would be accessible with restrictions beyond standard lease terms, and the remaining 94% would be accessible under standard lease terms. Within the potential geothermal areas, 1% would be inaccessible for leasable mineral exploration and development, approximately 4% would be accessible with restrictions beyond standard lease terms, and the remaining 95% would be accessible under standard lease terms.

Table 4-372. Constraints on Leasable Mineral Development in Alternative III (Acres)

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
1. No Leasing	79,000	5,000	5,000
2. Leasing, No Surface Occupancy	9,000	9,000	9,000
3. Leasing, Cumulative Timing Limitations > 9[B]	0	0	0
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9	0	0	0
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6	0	0	0
6. Leasing, Cumulative Timing Limitations ≤ 3	0	0	0
7. Leasing, Controlled Surface Use Only	8,000	4,000	3,000
8. Leasing, Standard Lease Terms	1,275,000	288,000	349,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Some acres in Categories 4 through 7 may also have a controlled surface use stipulation for RCAs.

Impacts from Management Specific to Alternative IV

The mineral leasing allocations specific to Alternative IV-A would result in 18% of the planning area being inaccessible for leasable mineral exploration and development; 15% would be inaccessible in Alternative IV-B. Approximately 53% of the planning area in Alternative IV-A and 55% in Alternative IV-B would be accessible with constraints such as NSO; seasonal restrictions in key sage-grouse habitat, big game winter range, and spawning habitat for bull trout and redband trout; and controlled surface use restrictions for RCAs. Even though Alternatives I, IV-A, and IV-B have timing limitations for the same species, more of these species' habitat would already be closed to mineral leasing in Alternatives IV-A and IV-B; therefore, there would be fewer acres available with timing limitations than in Alternative I. In Alternatives IV-A and IV-B, 30% of the planning area would be accessible under standard lease terms.

Within the potential oil and gas areas, approximately 11% would be inaccessible for leasable mineral exploration and development, approximately 27% would be accessible with restrictions beyond standard lease terms, and the remaining 62% would be accessible under standard lease terms. Within the potential geothermal areas, 2% would be inaccessible for leasable mineral exploration and development, approximately 8% would be accessible with restrictions beyond standard lease terms, and the remaining 90% would be accessible under standard lease terms.

Table 4-373. Constraints on Leasable Mineral Development in Alternative IV (Acres)

Category	Planning area		Potential Oil and Gas Areas	Potential Geothermal
	IV-A	IV-B		
1. No Leasing	242,000	210,000	35,000	8,000
2. Leasing, No Surface Occupancy	25,000		19,000	17,000
3. Leasing, Cumulative Timing Limitations > 9 Months [C]	0		0	0
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9	187,000	194,000	19,000	200
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6	498,000	523,000	43,000	8,000
6. Leasing, Cumulative Timing Limitations ≤ 3	5,000		1,000	400
7. Leasing, Controlled Surface Use Only	7,000		1,000	3,000
8. Leasing, Standard Lease Terms	407,000		189,000	331,000

[A] Categories are arranged in decreasing levels of constraint.

[B] Management in the potential oil and gas and potential geothermal areas does not differ between Alternatives IV-A and IV-B.
[C] Some acres in Categories 4 through 7 may also have a controlled surface use stipulation for RCAs.

Impacts from Management Specific to Alternative V

The mineral leasing allocations specific to Alternative V would result in 13% of the planning area being inaccessible for leasable mineral exploration and development. Approximately 19% of the planning area would be accessible with constraints such as NSO; seasonal restrictions in key sage-grouse habitat, and spawning habitat for bull trout and redband trout; and controlled surface use restrictions for RCAs; 68% of the planning area would be accessible under standard lease terms.

Within the potential oil and gas areas, approximately 13% would be inaccessible for leasable mineral exploration and development, approximately 19% would be accessible with restrictions beyond standard lease terms, and the remaining 68% would be accessible under standard lease terms. Within the potential geothermal areas, approximately 3% would be inaccessible for leasable mineral exploration and development, approximately 5% would be accessible with restrictions beyond standard lease terms, and the remaining 92% would be accessible under standard lease terms.

Table 4-374. Constraints on Leasable Mineral Development in Alternative V (Acres)

Category	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
1. No Leasing, Administrative	183,000	41,000	12,000
2. Leasing, No Surface Occupancy	25,000	19,000	17,000
3. Leasing, Cumulative Timing Limitations > 9[B]	0	0	0
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9	192,000	35,000	0
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6	27,000	1,000	2,000
6. Leasing, Cumulative Timing Limitations ≤ 3	5,000	1,000	300
7. Leasing, Controlled Surface Use Only	5,000	400	700
8. Leasing, Standard Lease Terms	934,000	209,000	335,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Some acres in Categories 4 through 7 may also have a controlled surface use stipulation for RCAs.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The mineral leasing allocations specific to Alternative VI would result in 7% of the planning area being inaccessible for leasable mineral exploration and development. Approximately 68% of the planning area would be accessible with constraints such as NSO; seasonal restrictions in sage-management area, big game winter range, and spawning habitat for bull trout and redband trout; and controlled surface use restrictions for RCAs; 25% of the planning area would be accessible under standard lease terms.

Within the potential oil and gas areas, approximately 2% would be inaccessible for leasable mineral exploration and development, approximately 37% would be accessible with restrictions beyond standard lease terms, and the remaining 61% would be accessible under standard lease terms. Within the potential geothermal areas, approximately 2% would be inaccessible for leasable mineral exploration and development, approximately 14% would be accessible with restrictions beyond standard lease terms, and the remaining 84% would be accessible under standard lease terms.

Table 4-375. Constraints on Leasable Mineral Development in Alternative VI (Proposed RMP) (Acres)

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
1. No Leasing	95,000	5,000	5,000
2. Leasing, No Surface Occupancy	26,000	19,000	17,000

Category [A]	Planning Area	Potential Oil and Gas Areas	Potential Geothermal Areas
3. Leasing, Cumulative Timing Limitations > 9[B]	0	0	0
4. Leasing, Cumulative Timing Limitations > 6 to ≤ 9	791,000	78,000	2,000
5. Leasing, Cumulative Timing Limitations > 3 to ≤ 6	121,000	12,000	28,000
6. Leasing, Cumulative Timing Limitations ≤ 3	500	2,000	400
7. Leasing, Controlled Surface Use Only	3,000	2,000	3,000
8. Leasing, Standard Lease Terms	335,000	189,000	309,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Some acres in Categories 4 through 7 may also have a controlled surface use stipulation for RCAs.

Impacts from Soil Resources Actions

Restrictions on uses in areas with potential for wind or water erosion would constrain leasable mineral exploration and development by requiring exploration and development operations to employ erosion control, timely and effective reclamation, and other mitigation measures at all sites to reduce impacts to those areas. Mitigation measures would increase costs and reduce the profitability of operations. In many cases, these would be considered typical costs of doing business on public lands, but any increase in cost would potentially impact leasable mineral development. Table 4-376 summarizes the impacts to mineral leasing from soil resources actions.

Table 4-376. Areas with Soil-Related Restrictions that May Affect Mineral Leasing by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
By Type of Constraint							
Water Erosion	0	443,000	443,000	443,000	1,296,000	1,296,000	1,296,000
Wind Erosion	0	218,000	218,000	218,000	1,129,000	1,129,000	1,129,000
Slope	0	69,000	69,000	69,000	69,000	69,000	69,000
Footprint Acres of Constraints Due to Water and Wind Erosion Potential and Slope							
Planning Area	0	709,000	709,000	709,000	1,155,000	1,155,000	1,155,000
Potential Oil and Gas Area	0	147,000	147,000	147,000	244,000	244,000	244,000
Potential Geothermal Area	0	205,000	205,000	205,000	247,000	247,000	247,000

Impacts from Management Specific to the No Action Alternative

Soil management direction for the No Action Alternative does not specifically reference mineral leasing. The general guidelines provided would result in negligible impacts to mineral leasing, as they only require soil resources be considered in project-level planning.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Minimizing soil erosion by maintaining adequate perennial vegetation cover would result in minor constraints to mineral leasing, exploration, and development, as all disturbed areas would need to be reseeded to provide perennial vegetation cover.

Impacts from Management Common to All Action Alternatives

Modifying routes or mitigating the erosive effects of transportation and travel would indirectly affect mineral leasing as it would apply to any ancillary routes developed or used for exploration and development.

Impacts from Management Specific to Alternatives I, II, and III

Management specific to Alternatives I, II, and III would result in more constraints to mineral leasing than the No Action Alternative. These alternatives would require mitigation on soils with severe or very severe potential for wind erosion or with high potential for water erosion. In these areas, as well as areas with slopes greater than 20%, an erosion control strategy for mineral exploration and development would be required. These constraints would be similar to a controlled surface use stipulation. Overall, these soil resource actions would constrain 52% of the planning area, 48% of the potential oil and gas areas, and 56% of the potential geothermal areas.

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Management specific to Alternatives IV, V, and VI would result in more constraints to mineral leasing than the No Action Alternative and Alternatives I, II, and III due to more restrictive management applied to a larger area. Alternatives IV, V, and VI would require mitigation on soils with moderate, severe, or very severe potential for wind erosion or with medium or high potential for water erosion. In these areas, as well as areas with slopes between 20% and 40% (46,000 acres), an erosion control strategy for mineral exploration and development would be required as well. These constraints would be similar to a controlled surface use stipulation. No surface disturbance from mineral exploration and development would be allowed on slopes greater than 40% (22,000 acres); this would be similar to a no surface occupancy stipulation in these areas. Overall, these soil resource actions would constrain 84% of the planning area, 79% of the potential oil and gas areas, and 67% of the potential geothermal areas.

Impacts from Special Status Species Actions

The Endangered Species Act (ESA) Section 7 Consultation Stipulation is part of the management for leasable minerals. However, other management for special status species would also constrain leasable mineral exploration and development in special status species habitat by requiring additional mitigation measures to reduce impacts to those areas. There would be some instances where the avoidance of an ESA-listed species or its habitat and the application of mitigation measures would cause great impacts on a particular operation. These measures would result in added cost, delays, and in some cases, would preclude development.

Development projects would face additional mitigation costs and increased operational logistics if the project would impact a non-listed special status species in a manner that would contribute to the species becoming listed under ESA. However, in most cases, mitigation for those species would not result in high costs that would prevent development, as protection and mitigation measures would typically be less rigorous or stringent than those for listed species. Costs or delays from applying mitigation for non-listed special status species would add to other mitigation costs and delays, which would contribute to an overall effect of reducing mineral recovery or preventing a proposed operation from being implemented.

Impacts from Management Specific to the No Action Alternative

Mineral leasing would be constrained if the project area included areas within 0.75 miles of ferruginous hawk and prairie falcon nests by restricting occupancy from mid-March through June. Other occupancy restrictions described in the No Action Alternative are analyzed under *Impacts from Leasable Minerals Actions*. Other management in the No Action Alternative would constrain mineral leasing, exploration, and development if those activities would adversely impact special status plants throughout the planning area or any special status species in the Snake River corridor.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

If biological opinions or letters of concurrence contain conservation measures that relate to leasable minerals, mineral leasing in habitats for the relevant special status species would be constrained. The degree of constraint would be relative to the specific conservation measure. For instance, the current conservation measure to protect groundwater sources that contribute to Bruneau hot springsnail habitat would preclude geothermal leasing in areas in or near Bruneau hot springsnail habitat, if it was shown that there is a connection between the groundwater aquifer and the geothermal resources; these areas are within the areas with high potential for geothermal leasing.

Impacts from Management Common to All Action Alternatives

Special status species management common to all action alternatives would constrain mineral leasing if the lease or subsequent exploration and development would adversely affect special status species, as these activities would not be allowed without mitigation. The type and degree of constraint would be relative to the specific mitigation required.

Impacts from Management Specific to Alternatives I, III, IV, and V

Alternatives I, III, IV, and V would all result in restrictions on mineral leasing if the lease included areas within one mile of ferruginous hawk or prairie falcon nests by requiring leasing activities to be designed to minimize impacts to their prey base and availability of nesting material from February through July. The level of constraint would be greater than in the No Action Alternative.

Impacts from Management Specific to Alternative II

Alternative II would result in restrictions on mineral leasing if the lease included areas within 0.25 miles of ferruginous hawk or prairie falcon nests by requiring leasing activities to be designed to minimize impacts to their prey base and availability of nesting material from February through July; this would be less constraining than the No Action Alternative and Alternatives I, III, IV, V, and VI.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would result in restrictions on mineral leasing if the lease included areas within one mile of ferruginous hawk or 0.5 miles from prairie falcon or northern goshawk nests by requiring leasing activities to be designed to minimize impacts to their prey base and availability of nesting material from February through July. Alternative VI would also result in restrictions on mineral leasing in the sage-grouse management area. Any mineral leasing within the sage-grouse management area would be subject to time of day and season of year restrictions, route use restrictions, and be required to incorporate design features to reduce physical disturbance of sage-grouse, and eliminate effects to habitat. The level of constraint would be greater than in the No Action Alternative and all action alternatives.

Impacts from Paleontological Resources Actions

Management identified for vertebrate paleontological resources may constrain mineral leasing, as activities related to exploration and development, including seismic exploration, can affect those resources. This management constraint would only apply where paleontological resources were present. Authorized operations would be required to immediately bring to the attention of the authorized officer any discovery of paleontological resources. Activities affecting the discovery would be suspended immediately with the discovery left intact until the authorized officer is able to evaluate the discovery and take appropriate action to protect or remove the resource. In most cases, activities would not be suspended for an extended amount of time and impacts to development would not be great. In some rare cases involving major paleontological finds, production might be halted and/or operations moved. The areas most likely to be affected are those with high or very high potential for paleontological resources (Potential Fossil Yield Classification [PFYC] Classes 4 and 5, respectively). However, because the planning area does not contain any PFYC Class 4 areas, this analysis considers only those areas in PFYC Class 5.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Leasable mineral exploration and development in paleontological resource areas would be required to implement measures to protect those resources; mineral leasing in areas rated as PFYC Class 5 would be most likely to be affected by this management (121,000 acres).The potential oil and gas areas contain 91,000 acres (24% of the area) rated as PFYC Class 5 that would likely be constrained by paleontological resource actions; the potential geothermal areas contains 121,000 acres (23% of the area) rated as PFYC Class 5 that would likely be constrained by these actions.

Impacts from Visual Resources Actions

Visual Resource Management (VRM) Class allocations prescribe the level of change to the visual landscape that would be allowed in those areas. Surface disturbance related to leasable mineral exploration, development, and production facilities would need to meet objectives for the particular VRM

Class for the area. Areas in VRM Class I or II are managed to preserve or retain the existing character of the landscape, which would constrain leasable mineral exploration and development activities by requiring mitigation and special project considerations. This would involve relocation or elimination of certain facilities and measures to mitigate alterations to line, form, color, and texture, which would result in additional time and costs to project development. The costs would be substantial in VRM Class I areas and somewhat less substantial in VRM Class II areas. Areas in VRM Class III and IV would have the least constraint on mineral leasing and, therefore, the least impact to project costs. Table 4-377 summarizes the impacts to mineral leasing from visual resources actions; areas allocated to VRM Class I or II are assumed to result in the most constraint to mineral leasing.

Table 4-377. Areas with Visual Resource Restrictions that May Affect Mineral Leasing by Alternative (Acres)

VRM Class I and II Areas	Alternative						
	No Action	I	II	III	IV	V	VI
Planning Area	240,000	297,000	80,000	81,000	195,000	371,000	167,000
Potential Oil and Gas Areas	50,000	92,000	10,000	10,000	62,000	93,000	93,000
Potential Geothermal Areas	37,000	15,000	14,000	14,000	14,000	14,000	14,000

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 17% of the planning area would be managed to preserve or retain its existing visual character (VRM Class I and II areas); this would result in moderate to major constraints on mineral leasing within those areas. VRM Class I or II allocations would constrain 13% of the potential oil and gas areas and 7% of the potential geothermal areas.

Impacts from Management Specific to Alternative I

In Alternative I, 22% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on mineral leasing within those areas. VRM Class I or II allocations would constrain 30% of the potential oil and gas areas and 4% of the potential geothermal areas.

Impacts from Management Specific to Alternative II

In Alternative II, 6% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on mineral leasing within those areas. VRM Class I or II allocations would constrain 3% of the potential oil and gas areas and 4% of the potential geothermal areas.

Impacts from Management Specific to Alternative III

In Alternative III, 6% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on mineral leasing within those areas. VRM Class I or II allocations would constrain 3% of the potential oil and gas areas and 4% of the potential geothermal areas.

Impacts from Management Specific to Alternative IV

In Alternative IV, 14% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on mineral leasing within those areas. VRM Class I or II allocations would constrain 20% of the potential oil and gas areas and 4% of the potential geothermal areas.

Impacts from Management Specific to Alternative V

In Alternative V, 27% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on mineral leasing within those areas. VRM

Class I or II allocations would constrain 30% of the potential oil and gas areas and 4% of the potential geothermal areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 12% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on mineral leasing within those areas. VRM Class I or II allocations would constrain 30% of the potential oil and gas areas and 4% of the potential geothermal areas.

Summary of Direct and Indirect Impacts

Overall impacts to mineral leasing in the planning area and the potential oil and gas and potential geothermal areas are discussed below. For analysis purposes, to display the overall impact to mineral leasing resulting from the alternatives, the planning area acres were identified under three subheadings: *Accessibility Determined through Minerals Actions; Constraints Identified from Soil, Paleontological, and Visual Resource Actions*; and *Overall Accessibility*. Under *Accessibility Determined through Minerals Actions*, acres were identified as accessible under standard lease terms, accessible with restrictions, or inaccessible to leasable mineral development. Under *Constraints Identified from Soil, Paleontological, and Visual Resource Actions*, acres with constraints from these sections were identified as to whether they occurred within areas accessible to leasable mineral development under standard lease terms or areas accessible with restrictions. To determine overall accessibility, acres within accessible areas that had constraints from management actions for soil, paleontological, and visual resources were moved from the accessible category to accessible with restrictions. Acres with constraints from soil, paleontological, and visual resource actions within areas accessible with restrictions are captured in the overall accessible with restrictions category, while inaccessible acres remain the same. This process was repeated for the potential oil and gas areas and the potential geothermal areas to display the overall impact to mineral leasing in these areas.

Impacts from the No Action Alternative

From the leasable mineral allocations alone, 8% of the planning area would be inaccessible, 53% would be accessible with restrictions beyond standard lease terms, and 39% would be accessible with standard lease terms in the No Action Alternative. Within the area accessible under standard lease terms, 149,000 acres are assumed to contain areas rated as Potential Fossil Yield Classification (PFYC) Class 5 or would be allocated as Visual Resource Management (VRM) Class I or II, making these areas accessible with restrictions beyond standard lease terms. Integrating constraints from each section, 8% of the planning area would be inaccessible, 62% would be accessible with restrictions, and 30% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact soil resources or special status species.

After integrating constraints due to paleontological and visual resources in the potential oil and gas areas, 6% would be inaccessible, 55% would be accessible with restrictions, and 39% would be accessible with standard lease terms. After integrating constraints in the potential geothermal areas, 7% would be inaccessible, 32% would be accessible with restrictions, and 61% would be accessible with standard lease terms.

Overall, there would be no change in the level of constraint on oil and gas and geothermal leasing.

Impacts from Alternative I

From the leasable mineral allocations alone, 11% of the planning area would be inaccessible, 60% would be accessible with restrictions beyond standard lease terms, and 29% would be accessible with standard lease terms in Alternative I. Within the area accessible under standard lease terms, 348,000 acres have soils with severe or very severe potential for wind erosion or with high potential for water erosion, are on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms.

Integrating constraints from each section, 11% of the planning area would be inaccessible, 66% would be accessible with restrictions, and 23% would be accessible with standard lease terms. All of these areas

would be further constrained if leasable mineral exploration or development would impact special status species. Overall, Alternative I would constrain mineral leasing more than the No Action Alternative in the planning area as a whole, due to more areas being inaccessible to leasing or accessible with restrictions beyond standard lease terms.

After integrating constraints due to soil, paleontological, and visual resources in the potential oil and gas areas, 4% of those areas would be inaccessible, 78% would be accessible with restrictions, and 18% would be accessible with standard lease terms. Overall, the potential oil and gas areas would have a higher level of constraint than the No Action Alternative, due to more acres being accessible with restrictions beyond standard lease terms.

After integrating constraints in the potential geothermal areas, 23% of those areas would be inaccessible, 48% would be accessible with restrictions, and 29% would be accessible with standard lease terms. Overall, Alternative I would constrain mineral leasing in the potential geothermal areas more than the No Action Alternative, due to more acres being accessible with restrictions beyond standard lease terms.

Overall, there would be a moderate increase in the level of constraint on oil and gas and geothermal leasing.

Impacts from Alternative II

From the leasable mineral allocations alone, 5% of the planning area would be inaccessible, 2% would be accessible with restrictions beyond standard lease terms, and 93% would be accessible with standard lease terms in Alternative II. Within the area accessible under standard lease terms, 651,000 acres have soils with severe or very severe potential for wind erosion or with high potential for water erosion, are on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms.

Integrating constraints from each section, 5% of the planning area would be inaccessible, 42% would be accessible with restrictions, and 53% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact special status species. Overall, Alternative II would constrain mineral leasing less than the No Action Alternative and Alternative I in the planning area as a whole. Compared to the No Action Alternative, this would be due to fewer areas being accessible with restrictions beyond standard lease terms. Compared to Alternative I, this would be due to fewer areas being inaccessible to leasing or accessible with restrictions beyond standard lease terms.

After integrating constraints due to soil, paleontological, and visual resources in the potential oil and gas areas, 1% of those areas would be inaccessible, 57% would be accessible with restrictions, and 42% would be accessible with standard lease terms. Overall, the potential oil and gas areas would have a similar level of constraint as the No Action Alternative; however, fewer acres would be inaccessible but more areas would be accessible with restrictions beyond standard lease terms. Alternative II would have a lower level of constraint than Alternative I, due to fewer areas accessible with restrictions.

After integrating constraints in the potential geothermal areas, 23% of those areas would be inaccessible, 48% would be accessible with restrictions, and 29% would be accessible with standard lease terms. Overall, the potential geothermal areas would have a similar level of constraint as Alternative I.

Overall, there would be no change in the level of constraint on oil and gas leasing, but a moderate increase in the level of constraint on geothermal leasing.

Impacts from Alternative III

From the leasable mineral allocations alone, 6% of the planning would be inaccessible, 1% would be accessible with restrictions beyond standard lease terms, and 93% would be accessible with standard lease terms in Alternative III. Within the area accessible under standard lease terms, 650,000 acres have soils with severe or very severe potential for wind erosion or with high potential for water erosion, are on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms.

Integrating constraints from each section, 6% of the planning area would be inaccessible, 41% would be accessible with restrictions, and 53% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact special status species. Overall, Alternative III would constrain mineral leasing to the same degree as Alternative II, but less than the No Action Alternative and Alternative I in the planning area as a whole. Compared to the No Action Alternative, this would be due to fewer areas being accessible with restrictions beyond standard lease terms. Compared to Alternative I, this would be due to fewer areas being inaccessible to leasing or accessible with restrictions beyond standard lease terms.

After integrating constraints due to soil, paleontological, and visual resources in the potential oil and gas areas, 1% of those areas would be inaccessible, 57% would be accessible with restrictions, and 42% would be accessible with standard lease terms. Overall, the potential oil and gas areas would have a similar level of constraint as Alternative II.

After integrating constraints in the potential geothermal areas, 23% of those areas would be inaccessible, 48% would be accessible with restrictions, and 29% would be accessible with standard lease terms. Overall, the potential geothermal areas would have a similar level of constraint as Alternatives I and II.

Overall, there would be no change in the level of constraint on oil and gas leasing, but a moderate increase in the level of constraint on geothermal leasing.

Impacts from Alternative IV

In Alternative IV-A, from the leasable mineral allocations alone, 17% of the planning area would be inaccessible, 53% would be accessible with restrictions beyond standard lease terms, and 30% would be accessible with standard lease terms. Within the area accessible under standard lease terms, 559,000 acres have soils with moderate, severe or very severe potential for wind erosion or with medium or high potential for water erosion; are on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms. Integrating constraints from each section, 17% of the planning area would be inaccessible, 78% would be accessible with restrictions, and 5% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact special status species.

In Alternative IV-B, from the leasable mineral allocations alone, 15% of the planning area would be inaccessible, 55% would be accessible with restrictions beyond standard lease terms, and 30% would be accessible with standard lease terms. Within the area accessible under standard lease terms, 573,000 acres have soils with moderate, severe or very severe potential for wind erosion or with medium or high potential for water erosion; are on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms. Integrating constraints from each section, 15% of the planning area would be inaccessible, 80% would be accessible with restrictions, and 5% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact special status species.

Overall, Alternative IV would constrain mineral leasing more than the No Action Alternative and Alternatives I, II, and III in the planning area as a whole, in all cases due to more areas being inaccessible to leasing or accessible with restrictions beyond standard lease terms.

In Alternative IV, after integrating constraints due to soil, paleontological, and visual resources in the potential oil and gas areas, 11% of those areas would be inaccessible, 77% would be accessible with restrictions, and 12% would be accessible with standard lease terms. Overall, the potential oil and gas areas would have a higher level of constraint than in the No Action Alternative and Alternatives I, II, and III. Even though Alternative IV has a similar acreage inaccessible as the No Action Alternative, Alternative IV has more areas accessible with restrictions beyond standard lease terms. Compared to Alternatives I, II, and III, Alternative IV has more areas inaccessible to leasing or accessible with restrictions.

In Alternative IV, after integrating constraints in the potential geothermal areas, 21% of those areas would be inaccessible, 68% would be accessible with restrictions, and 11% would be accessible with standard lease terms. Overall, the potential geothermal areas would have a higher level of constraint than in the No Action Alternative and Alternatives I, II, and III. Alternative IV would have similar amounts inaccessible as the No Action Alternative and Alternatives I, II, and III, but would have more areas accessible with restrictions.

Overall, there would be a major increase in the level of constraint on oil and gas and geothermal leasing.

Impacts from Alternative V

From the leasable mineral allocations alone, 13% of the planning area would be inaccessible, 19% would be accessible with restrictions beyond standard lease terms, and 68% would be accessible with standard lease terms in Alternative V. Within the area accessible under standard lease terms, 938,000 acres have soils with moderate, severe or very severe potential for wind erosion or with medium or high potential for water erosion; area on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms.

Integrating constraints from each section, 13% of the planning area would be inaccessible, 77% would be accessible with restrictions, and 10% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact special status species. Overall, Alternative V would constrain mineral leasing more than the No Action Alternative and Alternatives I, II, and III in the planning area as a whole, in all cases due to more areas being inaccessible to leasing or accessible with restrictions beyond standard lease terms. Alternative V would constrain mineral leasing to a similar degree as Alternative IV.

After integrating constraints due to soil, paleontological, and visual resources in the potential oil and gas areas, 13% of those areas would be inaccessible, 74% would be accessible with restrictions, and 13% would be accessible with standard lease terms. The potential oil and gas areas would have a similar level of constraint as Alternative IV, with more inaccessible areas and fewer areas accessible with restrictions.

After integrating constraints in the potential geothermal areas, 22% of those areas would be inaccessible, 65% would be accessible with restrictions, and 13% would be accessible with standard lease terms. The potential geothermal areas would have a similar level of constraint as Alternative IV.

Overall, there would be a major increase in the level of constraint on oil and gas and geothermal leasing.

Impacts from Alternative VI (Proposed RMP)

From the leasable mineral allocations alone, 7% of the planning area would be inaccessible, 66% would be accessible with restrictions beyond standard lease terms, and 27% would be accessible with standard lease terms in Alternative VI. Within the area accessible under standard lease terms, 350,000 acres have soils with moderate, severe or very severe potential for wind erosion or with medium or high potential for water erosion; area on slopes greater than 20%, contain areas rated as PFYC Class 5, or would be allocated as VRM Class I or II, making these areas accessible with restrictions beyond standard lease terms.

Integrating constraints from each section, 7% of the planning area would be inaccessible, 70% would be accessible with restrictions, and 23% would be accessible with standard lease terms. All of these areas would be further constrained if leasable mineral exploration or development would impact special status species. Alternative VI would constrain mineral leasing more than the No Action Alternative and Alternatives II and III in the planning area as a whole, in all cases due to more areas being inaccessible to leasing or accessible with restrictions beyond standard lease terms. Alternative VI would constrain mineral leasing to a similar degree as Alternative I.

After integrating constraints due to soil, paleontological, and visual resources in the potential oil and gas areas, 2% of those areas would be inaccessible, 84% would be accessible with restrictions, and 14%

would be accessible with standard lease terms. The potential oil and gas areas would have a similar level of constraint as Alternative IV, with fewer inaccessible areas and more areas accessible with restrictions.

After integrating constraints in the potential geothermal areas, 19% of those areas would be inaccessible, 66% would be accessible with restrictions, and 15% would be accessible with standard lease terms. The potential geothermal areas would have a slightly lower level of constraint than Alternative IV.

Overall, there would be a major increase in the level of constraint on oil and gas and geothermal leasing.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area for mineral leasing includes the planning area as well as lands contained within other BLM field offices in southern Idaho, including portions of the Four Rivers, Bruneau, Burley, and Owyhee Field Offices, as these areas have similar leasable mineral potential as the planning area (Peterson, 1995).

Past, present, and reasonably foreseeable actions for the following resource use cumulatively affects mineral leasing:

- Minerals.

These actions are described in the *Introduction* to this chapter. In addition, past actions that have affected or constrained mineral leasing on Federal mineral estate within this region include the management direction contained within the Bruneau Management Framework Plan (MFP), Owyhee RMP, and the Twin Falls MFP to the extent those plans constrain or restrict mineral leasing. The Bruneau Field Office is currently developing a new RMP; however, as of this printing, this plan is still at the pre-draft stage. The Burley Field Office is scheduled to begin an RMP planning process within the next few years. These new RMPs may modify the type and location of constraints on mineral leasing and development; however, the type and extent of those changes are not known at this time.

The 1983 Bruneau MFP specifies that oil, gas, and geothermal leasing is allowed in the Bruneau Field Office, subject to stipulations to alleviate resource conflicts. Areas with additional no surface occupancy (NSO) restrictions include the Wild and Scenic River corridors of the Bruneau and Owyhee Rivers; the Mud Flat Oolite area; bighorn sheep habitat near the Bruneau River and Little Jacks, Big Jacks, Battle, and Deep Creeks; and areas on or nominated for the National Register of Historic Places (217,000 acres). These NSO areas also encompass several Special Recreation Management Areas (SRMAs), Wilderness areas, and Areas of Critical Environmental Concern (ACECs).

Past action in the Four Rivers Field Office that has affected mineral leasing includes the 1993 legislation to create the Snake River Birds of Prey National Conservation Area (NCA; Public Law 103-64). This legislation withdrew the entire NCA from the mineral leasing and mining laws.

The 1999 Owyhee RMP specifies several types of restrictions on mineral leasing within the Owyhee Field Office. 59,000 acres are closed to leasing, including the Oregon National Historic Trail, several SRMAs and ACECs, and canyons in bighorn sheep habitat. There is a NSO restriction year-round on 211,000 acres, including several recreation sites, bighorn sheep habitat outside of canyons, and the wild horse herd management area. Seasonal restrictions are in place on 365,000 acres for big game, sage-grouse, and long-billed curlew. The remainder of the Owyhee Field Office is available for leasing under standard lease terms.

The 1982 Twin Falls MFP provides management direction for the Twin Falls County portion of the Burley Field Office; this MFP specifies that the area is available for oil, gas, and geothermal leasing. Oil and gas exploration is restricted from November 15 to April 30 on critical big game winter range (57,000 acres) and from April 15 to June 15 in deer fawning areas. There is also a restriction on surface-disturbing activities on soils with severe potential for erosion. Other restrictions for cultural and paleontological

resources, upland game habitat, historic trails, timber areas, and raptor nesting sites would be determined on a site-specific basis.

Mineral leasing on State of Idaho mineral estate in the cumulative impact analysis area is administered by the State Board of Land Commissioners through Idaho Department of Lands. The State leases minerals to generate revenue for State endowment or general funds (IDL, 2009b); there are currently 7,000 acres under oil and gas lease and 3,000 acres under geothermal lease within the cumulative impact analysis area. Restrictions on mineral leasing on State lands beyond standard lease terms are determined on a case-by-case basis at the time of lease issuance if they are deemed necessary (Lomkin, 2009). Therefore, for the purposes of analysis, it is assumed that leasable minerals on State lands are accessible under standard lease terms.

Where the mineral estate is owned by private entities, those entities may place restrictions or constraints on mineral leasing; however, the type and extent of those restrictions are unknown. For the purposes of analysis, it is assumed that private entities are likely to impose at least some level of restriction on mineral leasing and therefore, that any leasable minerals contained on those lands are accessible with restrictions.

Table 4-378 describes the overall constraints on mineral leasing on mineral estate within the region, excluding BLM-managed lands within the planning area. Because the Reasonably Foreseeable Development Scenarios for oil and gas or geothermal development have not been prepared for the entire region, the cumulative impacts analysis considers impacts to mineral leasing as a whole. Overall, leasable minerals on 55% of the mineral estate within the region are accessible under standard lease terms, 34% are accessible with restrictions beyond standard lease terms, and 11% are inaccessible.

Table 4-378. Summary of Constraints on Mineral Leasing in the Region (Acres)

Mineral Estate Management	Mineral Estate	Accessible under Standard Lease Terms	Accessible with Restrictions	Inaccessible
Owyhee Field Office	1,409,000	774,000	576,000	59,000
Bruneau Field Office	1,543,000	1,326,000	217,000	0
Birds of Prey NCA	514,000	0	0	514,000
Burley Field Office (Twin Falls County only)	368,000	311,000	57,000[A]	0
State of Idaho	391,000	391,000	0	0
Private	854,000	0	854,000	0
Total	**5,079,000**	**2,802,000**	**1,704,000**	**573,000**

[A] Only includes big game winter range. Deer fawning range has not been mapped in this area.

Summary of Cumulative Impacts

Table 4-379 summarizes the cumulative impacts of the alternatives on leasable mineral development. Overall, Alternatives II and III would have the fewest cumulative impacts on mineral leasing in the region, followed by Alternative VI, the No Action Alternative, and then Alternative I. Alternatives IV-A, IV-B, and V would have the most cumulative impacts on mineral leasing. However, these impacts would mostly be due to a higher proportion of areas being accessible with restrictions; the proportion of areas inaccessible for mineral leasing does not vary much between alternatives when considered at the regional scale.

Table 4-379. Areas Available in the Region for Mineral Leasing by Alternative (Acres)

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Accessible under Standard Lease Terms								
Planning Area[A]	411,000	315,000	727,000	727,000	69,000	69,000	137,000	315,000
Rest of Region	2,802,000	2,802,000	2,802,000	2,802,000	2,802,000	2,802,000	2,802,000	2,802,000
Total	**3,213,000**	**3,117,000**	**3,529,000**	**3,529,000**	**2,871,000**	**2,871,000**	**2,939,000**	**3,117,000**

	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Accessible with Restrictions beyond Standard Lease Terms								
Planning Area [A]	850,000	905,000	565,000	562,000	1,070,000	1,097,000	1,056,000	960,000
Rest of Region	1,703,000	1,703,000	1,703,000	1,703,000	1,703,000	1,703,000	1,703,000	1,703,000
Total	**2,553,000**	**2,608,000**	**2,268,000**	**2,265,000**	**2,773,000**	**2,800,000**	**2,759,000**	**2,663,000**
Inaccessible								
Planning Area [A]	110,000	151,000	62,000	79,000	233,000	206,000	178,000	96,000
Rest of Region	572,000	572,000	572,000	572,000	572,000	572,000	572,000	572,000
Total	**686,000**	**723,000**	**634,000**	**651,000**	**805,000**	**778,000**	**750,000**	**668,000**

[A] Only includes BLM-managed lands within the planning area.

Cumulative Impacts from the No Action Alternative

If the No Action Alternative continues to be implemented, 50% of the mineral estate in the region would remain accessible under standard lease terms, while 40% would continue to be accessible with restrictions and 10% would continue to be inaccessible.

Cumulative Impacts from Alternative I

If Alternative I is implemented, 48% of the mineral estate in the region would be accessible under standard lease terms, while 40% would be accessible with restrictions and 12% would be inaccessible. This would result in slightly more constraint overall as compared to the No Action Alternative.

Cumulative Impacts from Alternative II

If Alternative II is implemented, 55% of the mineral estate in the region would be accessible under standard lease terms, while 35% would be accessible with restrictions and 10% would be inaccessible. This would be the largest proportion of the region being accessible to mineral leasing under standard lease terms.

Cumulative Impacts from Alternative III

If Alternative III is implemented, 55% of the mineral estate in the region would be accessible under standard lease terms, while 35% would be accessible with restrictions and 10% would be inaccessible. Along with Alternative II, this would be the largest proportion of the region being accessible to mineral leasing under standard lease terms.

Cumulative Impacts from Alternative IV

If Alternative IV-A is implemented, 45% of the mineral estate in the region would be accessible under standard lease terms, while 43% would be accessible with restrictions and 12% would be inaccessible. In Alternative IV-B, 45% would be accessible, but 43% would be accessible with restrictions and 12% would be inaccessible. Alternative IV-A would have the highest proportion of the region being inaccessible to mineral leasing, while Alternative IV-B would have the highest proportion of the region being accessible with restrictions; however, the differences between Alternatives IV-A and IV-B would be relatively minor.

Cumulative Impacts from Alternative V

If Alternative V is implemented, 46% of the mineral estate in the region would be accessible under standard lease terms, while 43% would be accessible with restrictions and 11% would be inaccessible. This alternative would have similar cumulative impacts as Alternative IV-B.

Cumulative Impacts from Alternative VI (Proposed RMP)

If Alternative VI is implemented, 48% of the mineral estate in the region would be accessible under standard lease terms, while 41% would be accessible with restrictions and 11% would be inaccessible. Alternative VI cumulative impacts would be very similar to Alternative I, but slightly more of the region would be accessible under standard lease terms and accessible with restrictions.

4.4.6.2. Salable Minerals

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to salable mineral development:

- **Amount of constraint on salable mineral development** – The primary factor within the alternatives that would affect the public's ability to acquire salable minerals through sale or permit is the amount of constraint the alternative would place on salable mineral development in the planning area; this indicator reflects the availability of BLM-managed lands for this type of activity.

The amount of constraint on salable mineral development within an area can vary widely. Some areas may be closed to salable mineral development entirely, while other areas may be open to salable mineral development, subject to site-specific National Environmental Policy Act (NEPA) analysis, stipulations, and 43 CFR 3600 regulations. Management for other resources within the planning area can constrain salable mineral development as well. Generally, constraints on salable mineral development would reduce flexibility in where salable minerals can be acquired and increase costs in acquiring these materials. Disposal of mineral materials is a discretionary action. According to regulation, the BLM will not dispose of mineral materials if its determined that the aggregate damage to public lands and resources would exceed the public benefits that the BLM expects from the proposed disposition. Sand and gravel are important commodities for local highway districts in south central Idaho, where volcanic deposits are widespread and alluvial deposits are sparse.

Salable minerals include common variety minerals and building materials such as sand, gravel, and stone; these are generally widespread, of low unit value, and often used for construction or landscaping materials. Salable mineral development refers to the disposal of salable minerals through a contract of sale or a free-use permit.

Methods and Assumptions

Impacts to salable mineral development from management in the *Salable Minerals*, *Soil Resources*, and *Visual Resources* sections of Chapter 2 were analyzed in detail. Management affecting salable mineral development found in the *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Species*, *Paleontological Resources*, *Cultural Resources*, *Lands with Wilderness Characteristics*, *Areas of Critical Environmental Concern*, *Wild and Scenic Rivers*, and *Wilderness Study Areas* is already incorporated in the salable mineral allocations and management actions and was not analyzed further. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for salable minerals. Impacts from management for salable minerals can be found under *Impacts from Minerals Actions* in the *Geologic Features, Soil Resources*, *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Paleontological Resources*, *Cultural Resources*, *Lands with Wilderness Characteristics*, and *Wild and Scenic Rivers* sections.

The amount of constraint on salable mineral development in each alternative was quantified through a Geographic Information System analysis of the salable mineral allocations and management actions and management actions for soil and visual resources as described in Chapter 2. The type of constraint was determined for each acre of BLM-managed lands within the planning area. The constraints were then arranged into a hierarchy that represents the varying types of constraint as follows:

- **Category 1: No Salable Mineral Development**– Lands that are withheld from salable mineral disposal based on discretionary decisions made by the BLM cannot be developed due to statute; this category includes the Bruneau-Jarbidge Rivers Wilderness and lands described in Chapter 2 as being closed to salable mineral development.

- **Category 2: Salable Mineral Development Allowed, Cumulative Timing Limitations greater than six months** – Lands where salable minerals development is allowed, but terms and conditions limit the time of the year when crushing and blasting can take place to more than six months to protect identified resources. Some Category 2 lands may have other surface use restrictions in addition to the timing limitation.
- **Category 3: Salable Mineral Development Allowed, Cumulative Timing Limitations less than or equal to six months** – Lands where salable minerals development is allowed, but terms and conditions limit the time of the year when crushing and blasting can take place to six months or less. Some Category 3 lands may have other surface use restrictions in addition to the timing limitation.
- **Category 4: Salable Mineral Development Allowed, Other Surface Use Restrictions** – Lands where salable mineral development is allowed subject to constraints due to management for Riparian Conservation Areas, soils, or visual resources.
- **Category 5: Salable Mineral Development Allowed** – Lands where salable mineral development is allowed subject to site-specific NEPA analysis, stipulations, and 43 CFR 3600 regulations.

Some salable mineral management direction cannot be quantified. In these cases, impacts are characterized as increasing or decreasing the amount of constraint on salable mineral development.

Assumptions used in the analysis of impacts to salable mineral development include the following:

- Salable minerals on land in Category 1 are generally inaccessible; salable minerals on lands in Categories 2 through 4 are accessible with restrictions; and salable minerals on lands in Category 5 are accessible with few restrictions.
- A given interval of timing limitation reflects a similar level of constraint on salable mineral development with or without restrictions based on management for soils or visual resources.
- The demand for mineral materials is expected to increase in proportion to the increase in the population base of the communities surrounding the planning area.
- Increased levels of constraint generally result in reduced opportunity for the public to acquire salable minerals.
- Salable minerals management applies to salable mineral development on BLM-managed lands.
- Management for areas with very high potential for paleontological resources (Potential Fossil Yield Classification [PFYC] Class 5) would place more constraint on salable mineral development than areas with lower potential for paleontological resources.
- Management for areas within Visual Resource Management (VRM) Classes I and II would place more constraint on salable mineral development than areas within VRM Classes III and IV.

Direct and Indirect Impacts

Impacts from Salable Minerals Actions

Table 4-380 summarizes the impacts of the salable minerals actions on salable mineral development. Overall, salable mineral development in the planning area would be most constrained in the No Action Alternative, followed by Alternatives IV-A and IV-B, and then Alternatives V, I, and VI. Alternatives II and III would have the least constraint of all alternatives.

Impacts from Management Specific to the No Action Alternative

Due to existing statutes, approximately 5% of the planning area is inaccessible for salable mineral development. The No Action Alternative identifies 700 acres to be managed for salable mineral development, less than 1% of the planning area. However, new sites may be established in 95% of the planning area if an existing site will not meet the applicant's needs and impacts to new sites can be sufficiently mitigated. For the purposes of this analysis and for comparison with the action alternatives, these areas are assumed to be accessible with restrictions.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Management common to the No Action Alternative and all action alternatives would result in some constraint on salable mineral development, as the use of existing sites would generally be promoted and

exploration for new sites would be an applicant's responsibility. The amount of constraint would be minor to negligible.

Table 4-380. Constraints on Salable Mineral Development by Alternative (Acres)

Category [A]	Alternative [B]							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
1. Not Allowed	62,000	171,000	89,000	105,000	268,000	236,000	209,000	121,000
2. Allowed, Cumulative Timing Limitations > 6 Months	0	100	500	100	1,000	100	100	100
3. Allowed, Cumulative Timing Limitations ≤ 6 Months	0	55,000	55,000	55,000	3,000	22,000	55,000	55,000
4. Allowed, Other Surface Use Restrictions	1,309,000	127,000	131,000	128,000	125,000	125,000	122,000	127,000
5. Allowed	700	1,019,000	1,096,000	1,083,000	975,000	987,000	986,000	1,068,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Table incorporates acres from management common to all action alternatives and management specific to each action alternative.

Impacts from Management Common to All Action Alternatives

Management common to all action alternatives would result in a moderate level of constraint on salable mineral development; this constraint would primarily apply to commercial operations. Due to existing statutes, approximately 5% of the planning area is inaccessible for salable mineral development. Restrictions on ground disturbance in areas rated as PFYC Class 5 would affect 9% of the planning area; the extraction of sand and gravel requires extensive surface and subsurface ground disturbance that would affect paleontological resources. Similar restrictions would apply in areas with important cultural resources; however, this would be determined on a site-specific basis and cannot be quantified at the planning area scale.

Seasonal restrictions for Endangered, Threatened, Proposed, or Candidate species, along with surface use restrictions in Riparian Conservation Areas (RCAs), would affect approximately 4% of the planning area. Constraints on salable mineral development would also include avoiding special status species and their habitats; where this would not be possible, additional mitigation would be required.

Management regarding reclamation indirectly increases the amount of constraint on salable mineral development; while not directly affecting where and when salable mineral development can occur, this management does provide some specific requirements for reclamation of salable mineral developments, which may increase costs.

The restrictions on salable mineral development due to statute; paleontological resources; Endangered, Threatened, Proposed, or Candidate species; and RCAs have been incorporated into the tables for management specific to each action alternative, as their specific acreage in each alternative may vary depending on how they overlap with each other and areas that would be closed administratively.

Impacts from Management Specific to Alternative I

The salable mineral allocations in Alternative I would result in 12% of the planning area being inaccessible for salable mineral development. Approximately 13% of the planning area would be accessible with restrictions common to all action alternatives or on salable mineral development in the Middle Snake Area of Critical Environmental Concern; 75% of the planning area would be accessible.

Impacts from Management Specific to Alternative II

The salable mineral allocations in Alternative II would result in 6% of the planning area being inaccessible for salable mineral development. Approximately 14% of the planning area would be accessible with constraints common to all action alternatives; 80% of the planning area would be accessible.

Impacts from Management Specific to Alternative III

The salable mineral allocations in Alternative III would result in 8% of the planning area being inaccessible for salable mineral development. Approximately 13% of the planning area would be accessible with constraints common to all action alternatives; 79% of the planning area would be accessible.

Impacts from Management Specific to Alternative IV

The salable mineral allocations in Alternative IV-A would result in 20% of the planning area being inaccessible for salable mineral development. Approximately 9% of the planning area would be accessible with constraints common to all action alternatives; 71% of the planning area would be accessible.

The salable mineral allocations in Alternative IV-B would result in 17% of the planning area being inaccessible for salable mineral development. Approximately 11% of the planning area would be accessible with constraints common to all action alternatives; 72% of the planning area would be accessible.

Impacts from Management Specific to Alternative V

The salable mineral allocations in Alternative V would result in 15% of the planning area being inaccessible for salable mineral development. Approximately 13% of the planning area would be accessible with constraints common to all action alternatives; 72% of the planning area would be accessible.

Impacts from Management Specific to Alternative VI (Proposed RMP)

The salable mineral allocations in Alternative VI would result in 9% of the planning area being inaccessible for salable mineral development. Approximately 13% of the planning area would be accessible with constraints common to all action alternatives; 78% of the planning area would be accessible.

Impacts from Soil Resources Actions

Restrictions on uses in areas with potential for soil erosion by wind or water would constrain salable mineral development by requiring additional mitigation measures or surface occupancy restrictions to reduce impacts to those areas. These types of measures would tend to increase costs of salable mineral development. Table 4-381 summarizes the impacts to salable mineral development from soil resources actions.

Table 4-381. Areas with Soil-Related Restrictions that May Affect Salable Mineral Development by Alternative (Acres)

Type of Restriction	Alternative						
	No Action	I	II	III	IV	V	VI
Water erosion	0	218,000	218,000	218,000	1,296,000	1,296,000	1,296,000
Wind erosion	0	437,000	437,000	437,000	1,129,000	1,129,000	1,129,000
Slope	0	69,000	69,000	69,000	69,000	69,000	69,000
Planning Area Total [A]	**0**	**703,000**	**703,000**	**703,000**	**1,155,000**	**1,155,000**	**1,155,000**

[A] Footprint acres; many of the areas with wind erosion, water erosion, and slope restrictions overlap.

Impacts from Management Specific to the No Action Alternative

Soil management direction for the No Action Alternative does not specifically reference salable mineral development. The general guidelines provided would result in negligible constraints on salable mineral development, as they only require soil resources be considered in project-level planning.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Minimizing soil erosion by maintaining adequate perennial vegetation cover would result in minor constraints to salable mineral development, as all disturbed areas would need to be reseeded to provide perennial vegetation cover; these constraints would apply to all alternatives.

Impacts from Management Common to All Action Alternatives

Modifying routes or mitigating the erosive effects of transportation and travel would indirectly affect salable mineral development as it would apply to any ancillary routes developed or used; these constraints would apply to all action alternatives.

Impacts from Management Specific to Alternatives I, II, and III

Management specific to Alternatives I, II, and III would result in more constraints to salable mineral development than the No Action Alternative. These alternatives would require mitigation on soils with severe or very severe potential for wind erosion or with high potential for water erosion. In these areas as well as areas with slopes greater than 20%, an erosion control strategy for salable mineral development would be required. Overall, 51% of the planning area would be constrained by these soil resource actions.

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Management specific to Alternatives IV, V, and VI would result in more constraints to salable mineral development than the No Action Alternative and Alternatives I, II, and III due to more restrictive management being applied to a larger area. Alternatives IV, V, and VI would require mitigation on soils with moderate, severe, or very severe potential for wind erosion or with medium or high potential for water erosion. In these areas as well as areas with slopes between 20% and 40% (46,000 acres), an erosion control strategy for mineral exploration and development would be required. No surface disturbance from mineral exploration and development would be allowed on slopes greater than 40% (22,000 acres); this would be similar to a no surface occupancy restriction in these areas. Overall, 99% of the planning area would be constrained by these soil resource actions.

Impacts from Visual Resources Actions

Visual Resource Management (VRM) Class allocations prescribe the level of change to the visual landscape that would be allowed in areas within each class. Areas in VRM Class I or II are managed to preserve or retain the existing character of the landscape, which would constrain salable mineral development by requiring mitigation and special project considerations to return the area to its pre-existing visual character; these measures would tend to increase project costs. Areas in VRM Class IV would have the least constraint on salable mineral development. Table 4-382 identifies the number of acres in each alternative in a VRM Class I and II that may impose restrictions on salable mineral development.

Table 4-382. Areas with Visual Resource Restrictions that May Affect Salable Mineral Development by Alternative (Acres)

VRM Class	Alternative						
	No Action	I	II	III	IV	V	VI
Class I and II	240,000	297,000	80,000	81,000	195,000	371,000	167,000

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 17% of the planning area would be managed to preserve or retain its existing visual character (VRM Class I and II); this would result in moderate to major constraints on salable mineral development within those areas.

Impacts from Management Specific to Alternative I

In Alternative I, 22% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on salable mineral development within those areas.

Impacts from Management Specific to Alternatives II and III

In Alternatives II and III, 6% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on salable mineral development within those areas.

Impacts from Management Specific to Alternative IV

In Alternative IV, 14% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on salable mineral development within those areas.

Impacts from Management Specific to Alternative V

In Alternative V, 27% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on salable mineral development within those areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 12% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on salable mineral development within those areas.

Summary of Direct and Indirect Impacts

Overall impacts to salable mineral development in the planning area are displayed in Table 4-383. For analysis purposes, planning area acres were identified under three subheadings: Accessibility Determined through Salable Minerals Actions, Constraints Identified from Soil and Visual Resource Actions, and Overall Accessibility. Under *Accessibility Determined through Salable Minerals Actions*, acres were identified as accessible, accessible with restrictions, or inaccessible to salable minerals development. Under *Constraints Identified from Soil and Visual Resource Actions*, acres with soil or visual resource constraints were identified as to whether they occurred within areas accessible to salable mineral development or areas accessible with restrictions. To determine overall accessibility, acres within accessible areas that had soil or visual resource constraints were moved from the accessible category to accessible with restrictions. Acres with soil or visual resource constraints within areas accessible with restrictions are captured in the overall accessible with restrictions category, while inaccessible acres remain the same.

Table 4-383. Summary of Impacts to Accessibility for Salable Mineral Development in the Planning Area by Alternative (Acres)

Accessibility	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Accessibility Determined through Salable Minerals Actions								
Accessible	700	1,019,000	1,096,000	1,083,000	975,000	987,000	986,000	1,068,000
Accessible with Restrictions	1,309,000	182,000	186,000	183,000	128,000	147,000	177,000	182,000
Inaccessible	62,000	171,000	89,000	105,000	268,000	236,000	209,000	121,000

Accessibility	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Constraints Identified from Soil and Visual Resource Actions [A]								
In Accessible Areas	100[B]	500,000	535,000	527,000	970,000	982,000	981,000	1,063,000
Overall Accessibility								
Accessible	600	519,000	561,000	556,000	5,000	5,000	5,000	5,000
Accessible with Restrictions	1,309,000	682,000	721,000	710,000	1,098,000	1,129,000	1,158,000	1,245,000
Inaccessible	62,000	171,000	89,000	105,000	268,000	236,000	209,000	121,000
Overall Acres with Constraints [C]	**1,371,000**	**852,000**	**810,000**	**815,000**	**1,366,000**	**1,366,000**	**1,366,000**	**1,366,000**

[A] Footprint acres; many of the acres for soil and visual resource restrictions overlap.
[B] Because the areas with the various mineral restriction categories cannot be mapped for the No Action Alternative, acres with visual resource constraints were distributed proportionally across the three categories for the purposes of analysis. This method assumes that the visual resource constraints are not correlated with any particular restriction category.
[C] Sum of acres accessible with restrictions and acres inaccessible to salable mineral development.

Impacts from the No Action Alternative

Within the area accessible for salable mineral development in the No Action Alternative, 100 acres are assumed to be allocated as Visual Resource Management (VRM) Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, 5% of the planning area would be inaccessible, 95% would be accessible with restrictions, and less than 1% would be accessible. These areas would be further constrained if salable mineral development would impact soil resources.

Overall, there would be no change in the level of constraint on salable mineral development.

Impacts from Alternative I

Within the area accessible for salable mineral development in Alternative I, 500,000 acres have severe or very severe potential for wind erosion, have high potential for water erosion, are on slopes greater than 20%, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 12% of the planning area would be inaccessible, 50% would be accessible with restrictions, and 38% would be accessible. Overall, Alternative I would constrain salable mineral development less than the No Action Alternative; even though more acres would be inaccessible in Alternative I, fewer acres would be accessible with restrictions.

Overall, there would be a moderate decrease in the level of constraint on salable mineral development.

Impacts from Alternative II

Within the area accessible for salable mineral development in Alternative II, 535,000 acres have severe or very severe potential for wind erosion; have high potential for water erosion, are on slopes greater than 20%, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 6% of the planning area would be inaccessible, 53% would be accessible with restrictions, and 41% would be accessible. Overall, Alternative II would constrain salable mineral development less than the No Action Alternative and Alternative I.

Overall, there would be a major decrease in the level of constraint on salable mineral development.

Impacts from Alternative III

Within the area accessible for salable mineral development in Alternative III, 527,000 acres have severe or very severe potential for wind erosion, have high potential for water erosion, are on slopes greater than 20%, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 8% of the planning area would be inaccessible, 52%

would be accessible with restrictions, and 40% would be accessible. Overall, Alternative III would constrain salable mineral development slightly more than Alternative II, due to slightly more acres being inaccessible to salable mineral development. Alternative III would still result in less constraint on salable mineral development than the No Action Alternative and Alternative I.

Overall, there would be a major decrease in the level of constraint on salable mineral development.

Impacts from Alternative IV

Within the area accessible for salable mineral development in Alternative IV-A, 970,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 20% of the planning area would be inaccessible, 80% would be accessible with restrictions, and less than 1% would be accessible.

Within the area accessible for salable mineral development in Alternative IV-B, 982,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 17% of the planning area would be inaccessible, 82% would be accessible with restrictions, and less than 1% would be accessible.

Overall, Alternatives IV-A and IV-B would have a similar level of constraint on salable mineral development, with Alternative IV-A having slightly more areas inaccessible than Alternative IV-B. Both Alternatives IV-A and IV-B would have much more constraint on mineral leasing than Alternatives I, II, and III, but still less constraint than the No Action Alternative.

Overall, there would be a minor decrease in the level of constraint on salable mineral development.

Impacts from Alternative V

Within the area accessible for salable mineral development in Alternative V, 981,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%; or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 15% of the planning area would be inaccessible, 84% would be accessible with restrictions, and less than 1% would be accessible. Overall, Alternative V would constrain salable mineral development to a similar level as Alternative IV, with slightly fewer acres being inaccessible.

Overall, there would be a minor decrease in the level of constraint on salable mineral development.

Impacts from Alternative VI (Proposed RMP)

Within the area accessible for salable mineral development in Alternative VI, 1,063,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%; or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, salable minerals on 9% of the planning area would be inaccessible, 91% would be accessible with restrictions, and less than 1% would be accessible. Overall, Alternative VI would constrain salable mineral development to a similar level as Alternatives IV and V, with fewer acres being inaccessible.

Overall, there would be a minor decrease in the level of constraint on salable mineral development.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area for salable mineral development includes lands contained within the Bruneau and Jarbidge Field Offices and the Twin Falls County portion of the Burley Field Office. Entities

that obtain salable minerals from lands within the planning area are likely to obtain salable minerals from these nearby field offices as well. The cost of transporting mineral materials makes it less likely that lands within other adjacent field offices would be sources for mineral materials for projects in the Jarbidge Field Office area.

Past, present, and reasonably foreseeable actions for the following resource use cumulatively affects salable mineral development:

- Minerals.

These actions are described in the *Introduction* to this chapter. In addition, past actions that have affected or constrained salable mineral development on Federal mineral estate within this region include the implementation of the Bruneau and Twin Falls Management Framework Plan (MFPs) (BLM, 1982, 1983), to the extent those existing plans constrain or restrict salable mineral development. The Bruneau Field Office is currently developing a new RMP; however, as of this printing, this plan is still at the pre-draft stage. The Burley Field Office is scheduled to begin an RMP planning process within the next few years. These new RMPs may modify the type and location of constraints on salable mineral development; however, type and extent of those changes, if any, are not known at this time.

The 1983 Bruneau MFP specifies that the Bruneau Field Office should provide salable minerals to meet local demands. A total of 155,000 acres are closed to salable mineral development, including Wilderness areas, three Areas of Critical Environmental Concern, and three Special Recreation Management Areas (SRMAs). Salable mineral development is restricted in one SRMA (122,000 acres).

The 1982 Twin Falls MFP provides management direction for the Twin Falls County portion of the Burley Field Office; this MFP specifies that 20 to 30 acres near Hollister and 40 to 80 acres near Salmon Falls Creek Canyon are available for establishment of community sand and gravel pits. Extraction areas for building stone were identified on 160 acres, while 160 acres near Rabbit Springs were designated as a rockhounding area. The MFP also reserved other material source areas until demand warrants their development. For the purposes of analysis, it is assumed that a total of 430 acres of BLM-managed land are accessible for salable mineral development within the western portion of the Burley Field Office; the remaining acres are assumed to be accessible with restrictions.

Salable mineral development on State of Idaho mineral estate is administered by Idaho Department of Lands. Restrictions on leasing salable minerals on State land beyond standard lease terms are determined on a case-by-case basis at the time of lease issuance if they are deemed necessary (Lomkin, 2009). However, 960 acres in the cumulative impact analysis area are unlikely to be leased for salable mineral development due to an existing US Air Force lease (Lomkin, 2009). For the purposes of this analysis, it is assumed that salable minerals on all other State lands are accessible.

Where the mineral estate is owned by private entities, those entities may place restrictions or constraints on salable mineral development; however, the type and extent of those restrictions, if any, are unknown. For the purposes of analysis, it is assumed that private entities are likely to impose at least some level of restriction on salable mineral development and therefore, that any salable minerals contained on those lands are accessible with restrictions.

Table 4-384 describes the constraints on salable mineral development on mineral estate within the region, excluding BLM-managed lands within the planning area. Overall, salable minerals on 53% of the mineral estate within the region are accessible, 41% are accessible with restrictions, and 6% are inaccessible.

Table 4-384. Summary of Constraints on Salable Mineral Development in the Region, excluding the Planning Area (Acres)

Mineral Estate Management	Mineral Estate	Accessible	Accessible with Restrictions	Inaccessible
BLM-Managed Lands				
Bruneau Field Office	1,543,000	1,266,000	122,000	155,000
Burley Field Office (Twin Falls County only)	368,000	400	367,000	0
Other Lands				
State of Idaho	215,000	214,000	0	960
Private	640,000	0	640,000	0
Total	**2,766,000**	**1,480,000**	**1,129,000**	**156,000**

Summary of Cumulative Impacts

Table 4-385 summarizes the cumulative impacts of the alternatives on salable mineral development. Overall, Alternatives II and III would have the fewest cumulative impacts on salable mineral development in the region, followed by Alternative I, then Alternatives IV-A, IV-B, V, and VI. The No Action Alternative would have the most cumulative impacts on salable mineral development. However, this impact would be due entirely to the No Action Alternative having a higher proportion of areas being accessible with restrictions.

Table 4-385. Areas Available in the Region for Salable Mineral Development by Alternative (Acres)

Accessibility	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Accessible								
Planning Area [A]	600	519,000	561,000	556,000	5,000		5,000	5,000
Rest of Region	1,480,000	1,480,000	1,480,000	1,480,000	1,480,000		1,480,000	1,480,000
Total	**1,481,000**	**1,999,000**	**2,041,000**	**2,036,000**	**1,485,000**		**1,485,000**	**1,485,000**
Accessible with Restrictions								
Planning Area [A]	1,309,000	682,000	721,000	710,000	1,098,000	1,129,000	1,158,000	1,245,000
Rest of Region	1,130,000	1,130,000	1,130,000	1,130,000	1,130,000	1,130,000	1,130,000	1,130,000
Total	**2,439,000**	**1,812,000**	**1,851,000**	**1,840,000**	**2,228,000**	**2,259,000**	**2,288,000**	**2,375,000**
Inaccessible								
Planning Area [A]	62,000	171,000	89,000	105,000	268,000	236,000	209,000	121,000
Rest of Region	156,000	156,000	156,000	156,000	156,000	156,000	156,000	156,000
Total	**218,000**	**327,000**	**245,000**	**261,000**	**424,000**	**392,000**	**365,000**	**277,000**

[A] Only includes BLM-managed lands within the planning area.

Cumulative Impacts from the No Action Alternative

If the No Action Alternative continues to be implemented, 36% of the mineral estate in the region would remain accessible for salable mineral development, while 59% would continue to be accessible with restrictions and 5% would continue to be inaccessible.

Cumulative Impacts from Alternative I

If Alternative I is implemented, 48% of the mineral estate in the region would be accessible for salable mineral development, while 44% would be accessible with restrictions and 8% would be inaccessible. This would result in less constraint overall and fewer cumulative impacts as compared to the No Action Alternative.

Cumulative Impacts from Alternative II

If Alternative II is implemented, 49% of the mineral estate in the region would be accessible for salable mineral development, while 45% would be accessible with restrictions and 6% would be inaccessible.

This would result in the largest proportion of the region being accessible to salable mineral development without additional restrictions and, along with Alternative III, the fewest cumulative impacts of the alternatives.

Cumulative Impacts from Alternative III

If Alternative III is implemented, 49% of the mineral estate in the region would be accessible for salable mineral development, while 45% would be accessible with restrictions and 6% would be inaccessible. Along with Alternative II, this would result in the largest proportion of the region being accessible to salable mineral development without additional restrictions and the fewest cumulative impacts of the alternatives.

Cumulative Impacts from Alternative IV

If Alternative IV-A is implemented, 36% of the mineral estate in the region would be accessible for salable mineral development, while 54% would be accessible with restrictions and 10% would be inaccessible. In Alternative IV-B, 36% of the mineral estate in the region would be accessible for salable mineral development, while 55% would be accessible with restrictions and 9% would be inaccessible. The differences between Alternatives IV-A and IV-B are relatively minor. Both alternatives would result in the highest proportion of the region being inaccessible to salable mineral development; however, the overall level of constraint and the degree of cumulative impacts would be lower than in the No Action Alternative.

Cumulative Impacts from Alternative V

If Alternative V is implemented, 36% of the mineral estate in the region would be accessible for salable mineral development, while 55% would be accessible with restrictions and 9% would be inaccessible. This alternative would have similar cumulative impacts as Alternative IV, with slightly fewer acres being inaccessible to salable mineral development.

Cumulative Impacts from Alternative VI (Proposed RMP)

If Alternative VI is implemented, 36% of the mineral estate in the region would be accessible for salable mineral development, while 57% would be accessible with restrictions and 7% would be inaccessible. This alternative would have similar cumulative impacts as Alternatives IV and V, with fewer acres being inaccessible to salable mineral development.

4.4.6.3. Locatable Minerals

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to locatable mineral development:

- **Amount of constraint on locatable mineral development** – The primary factor within the alternatives that would affect the public's ability to prospect, explore, and develop locatable minerals is the amount of constraint the alternative would place on locatable mineral development in the planning area; this indicator reflects the availability of BLM-managed lands for this type of activity.

The amount of constraint on locatable mineral development within an area can vary widely. Some areas may be withdrawn from locatable mineral entry under the general mining laws and be unavailable for locatable mineral development, while other areas may be available for locatable mineral entry with no mitigation measures required. Other management prescribed by the alternatives may result in stipulations or measures for mitigation or reclamation. These would not affect where locatable mineral development would occur, but would reduce the public's flexibility and increase their costs in developing a claim.

Locatable minerals include gold, silver, copper, gem stones, lead, zinc, barite, gypsum, and certain varieties of high-calcium limestone, and other uncommon variety minerals. Locatable mineral development refers to the prospecting, exploration, and development of these minerals under the General Mining Law of 1872. As described in Chapter 3, exploration for and development of locatable mineral

resources are nondiscretionary activities, meaning the BLM cannot prohibit reasonably necessary activities required for the prospecting, exploration, and development of valuable locatable mineral deposits. The 43 CFR 3809 regulations gives the BLM the authority to regulate these activities and require mitigation or changes in operational practices to ensure activities do not result in "unnecessary or undue" degradation of the environment (43 CFR 3809.4).

Methods and Assumptions

Impacts to locatable mineral development from management in the following sections of Chapter 2 were analyzed in detail: *Locatable Minerals*, *Soil Resources*, *Paleontological Resources*, and *Visual Resources*. Impacts from management in the *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Species*, *Areas of Critical Environmental Concern*, *Wild and Scenic Rivers*, and *Wilderness Study Areas* sections were not analyzed in detail because the impacts were captured in the analysis of locatable minerals actions. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for locatable minerals. Impacts from management for locatable minerals can be found under *Impacts from Minerals Actions* in the *Geologic Features, Soil Resources*, *Water Resources*, *Riparian Areas and Wetlands*, *Fish*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Paleontological Resources*, *Cultural Resources*, *Lands with Wilderness Characteristics*, and *Wild and Scenic Rivers* sections.

The amount of constraint on locatable mineral development in each alternative was quantified through a Geographic Information System analysis of the locatable mineral allocations and management actions for soil, paleontological, and visual resources described in Chapter 2. The type of constraint was determined for each acre of BLM-managed lands within the planning area. The constraints were then arranged into a hierarchy that represents the varying types of constraint as follows:

- **Category 1: No Locatable Mineral Development, Existing Withdrawals** – Lands where locatable minerals currently cannot be prospected, explored for, or developed due to existing withdrawals, such as the Bruneau-Jarbidge Rivers Wilderness. Approximately 4% of the planning area (60,000 acres) has already been withdrawn under the mining laws.
- **Category 2: No Locatable Mineral Development, Recommended Withdrawals** – Lands where locatable minerals currently can be prospected, explored for, or developed but would be recommended for withdrawal in a particular alternative.
- **Category 3: Locatable Mineral Development Allowed, with Additional Mitigation or Reclamation Requirements** – Lands not currently under an existing withdrawal from location under the mining laws nor recommended for withdrawal in a particular alternative, but where additional management direction is likely to result in additional mitigation or reclamation requirements.
- **Category 4: Locatable Mineral Development Allowed** – Lands not currently under an existing withdrawal from location under the mining laws nor recommended for withdrawal in a particular alternative and where additional mitigation or reclamation requirements are less likely.

Some management direction in the sections analyzed in detail that would affect locatable mineral development cannot be quantified. In these cases, impacts are characterized as increasing or decreasing the amount of constraint on locatable mineral development.

Assumptions were developed based on BLM knowledge of locatable mineral development and the planning area. These assumptions should not be construed to confine or redefine management contained within alternatives and were used to allow a comparison of impacts to locatable mineral development resulting from the alternatives. Assumptions used in this analysis of impacts to locatable mineral development include the following:

- Any areas recommended for withdrawal in Chapter 2 would be withdrawn. As a result, acres recommended for withdrawal as well as those already withdrawn (i.e., Categories 1 and 2) will be assumed to be unavailable for locatable mineral development for the purposes of this analysis. Locatable minerals on these lands are considered to be inaccessible.

- Aside from the locatable mineral allocations, most management that would affect locatable mineral development provides direction for reclamation or mitigation activities rather than direction for where location of mining claims may occur. This management, rather than preclude locatable mineral development in an area, would likely increase the costs associated with the development. Category 3 contains lands with these types of constraints; locatable minerals on these lands are considered to be accessible with restrictions. Locatable minerals on Category 4 lands are considered accessible with few restrictions.
- Locatable mineral development is expected to occur at levels similar to the past. Currently, there are 13 active mining claims (eight placer claims and five lode claims) in the planning area; and fewer than 100 acres are affected by this type of activity.
- Locatable minerals management applies to mineral entry on BLM-managed lands.
- Management for areas with very high potential for paleontological resources (Potential Fossil Yield Classification Class 5) would result in more constraint on locatable mineral development than areas with lower potential for paleontological resources.
- Management for areas within Visual Resource Management (VRM) Classes I and II would result in more constraint on locatable mineral development than areas within VRM Classes III and IV.

Direct and Indirect Impacts

Impacts from Locatable Minerals Actions

Table 4-386 summarizes the impacts of the locatable minerals actions on locatable mineral development. Overall, based on areas inaccessible to locatable mineral development, locatable mineral development in the planning area would be most constrained in the No Action Alternative, followed by Alternatives I and IV, and then Alternative III. Alternatives II and V would have the fewest areas inaccessible to locatable mineral development. The proportion of BLM-managed lands in the planning area where locatable mineral development would be allowed with additional mitigation or reclamation requirements specified in the *Minerals* section of Chapter 3 would be relatively similar for all action alternatives.

Table 4-386. Constraints on Locatable Mineral Development by Alternative (Acres)

Category	Alternative						
	No Action	I	II	III	IV	V	VI
Existing withdrawal	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Recommended withdrawal	158,000[B]	69,000	26,000	28,000	83,000	33,000	0
Allowed with additional mitigation or reclamation requirements	0	284,000	301,000	301,000	274,000	299,000	841,000
Allowed	1,153,000	958,000	983,000	982,000	955,000	979,000	470,000

[A] Categories are arranged in decreasing levels of constraint.
[B] Locations recommended for withdrawal were not mapped in the 1987 Jarbidge RMP. This analysis assumes that these areas are in addition to areas already withdrawn, as descriptions of these in Chapter 2 suggest that none of these areas lay within existing withdrawals.

Impacts from Management Specific to the No Action Alternative

If the areas recommended for withdrawal were withdrawn by the Secretary of the Interior or Congress, locatable minerals on approximately 16% of the planning area would be inaccessible. Locatable minerals on the remaining 84% of the planning area would be accessible. The No Action Alternative would have the largest portion of the planning area unavailable for locatable mineral development.

Impacts from Management Common to All Action Alternatives

Due to existing withdrawals, approximately 4% of the planning area is inaccessible for locatable mineral development. Management common to all action alternatives would place stipulations or mitigation measures on locatable mineral plans of operation for operations that may cause unnecessary and undue degradation to resources, including habitat for sage-grouse. Mitigation measures for activities affecting Riparian Conservation Areas (RCAs) would follow direction contained in the Aquatic and Riparian Management Strategy (Appendix D), affecting 26,000 acres of BLM-managed lands. These stipulations

and measures would constrain locatable mineral development by increasing the costs associated with such development.

These restrictions on locatable mineral development due to statute, sage-grouse habitat, and RCAs have been incorporated into the tables for management specific to each action alternative, as their specific acreage in each alternative may vary depending on how they overlap with each other and areas that would be recommended for withdrawal.

Impacts from Management Specific to Alternative I

If the areas recommended for withdrawal were withdrawn, approximately 9% of the planning area would be unavailable for locatable mineral development. Locatable minerals on 21% would be accessible with restrictions related to sage-grouse and RCAs; the remaining 70% of the planning area would be accessible. Alternative I would have the third largest area unavailable to locatable mineral development behind the No Action Alternative and Alternative IV.

Impacts from Management Specific to Alternative II

If the areas recommended for withdrawal were withdrawn, approximately 6% of the planning area would be unavailable for locatable mineral development. Locatable minerals on 22% would be accessible with restrictions related to sage-grouse and RCAs; the remaining 72% of the planning area would be accessible. Alternative II would have the sixth largest area unavailable to locatable mineral development in the planning area.

Impacts from Management Specific to Alternative III

If the areas recommended for withdrawal were withdrawn, approximately 6% of the planning area would be unavailable for locatable mineral development. Locatable minerals on 22% would be accessible with restrictions related to sage-grouse and RCAs; the remaining 72% of the planning area would be accessible. Alternative III would have the fifth largest area unavailable to locatable mineral development in the planning area, behind the No Action Alternative and Alternatives I and IV.

Impacts from Management Specific to Alternative IV

If the areas recommended for withdrawal were withdrawn, approximately 10% of the planning area would be unavailable for locatable mineral development. Locatable minerals on 20% would be accessible with restrictions related to sage-grouse and RCAs; the remaining 70% of the planning area would be accessible. Alternative IV would have the second largest area unavailable to locatable mineral development in the planning area behind the No Action Alternative.

Impacts from Management Specific to Alternative V

If the areas recommended for withdrawal were withdrawn, approximately 7% of the planning area would be unavailable for locatable mineral development. Locatable minerals on 22% would be accessible with restrictions related to sage-grouse and RCAs; the remaining 71% of the planning area would be accessible. Alternative V would have the fourth largest area unavailable to locatable mineral development in the planning area.

Impacts from Management Specific to Alternative VI (Proposed RMP)

No additional areas would be recommended for withdrawal in Alternative VI leaving approximately 4% of the planning area unavailable for locatable mineral development. Locatable minerals on 61% would be accessible with restrictions related to sage-grouse and RCAs; the remaining 35% of the planning area would be accessible. Alternative VI would have the smallest area unavailable to locatable mineral development in the planning area and has the smallest area open with no mitigation or reclamation requirements.

Impacts from Soil Resources Actions

Restrictions on uses in areas with potential for soil erosion by wind or water would constrain locatable mineral development by requiring additional mitigation or reclamation measures to reduce impacts to

those areas. These types of measures would tend to increase costs of locatable mineral development. Table 4-387 summarizes the impacts to locatable mineral development from soil resources actions.

Table 4-387. Areas with Soil-Related Restrictions that May Affect Locatable Mineral Development by Alternative (Acres)

Type of Restriction	Alternative						
	No Action	I	II	III	IV	V	VI
Water erosion	0	218,000	218,000	218,000	1,296,000	1,296,000	1,296,000
Wind erosion	0	437,000	437,000	437,000	1,129,000	1,129,000	1,129,000
Slope	0	69,000	69,000	69,000	69,000	69,000	69,000
Planning Area Total [A]	**0**	**703,000**	**703,000**	**703,000**	**2,425,000**	**2,425,000**	**2,425,000**

[A] Footprint acres; many of the areas with wind erosion, water erosion, and slope restrictions overlap.

Impacts from Management Specific to the No Action Alternative

Soil management direction for the No Action Alternative does not specifically reference locatable mineral development. The general guidelines provided would result in negligible constraints on locatable mineral development, as they only require soil resources be considered in project-level planning.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Minimizing soil erosion by maintaining adequate perennial vegetation cover would result in minor constraints to locatable mineral development, as all disturbed areas would need to be reseeded to provide perennial vegetation cover.

Impacts from Management Common to All Action Alternatives

Modifying routes or mitigating the erosive effects of transportation and travel would indirectly affect locatable mineral development as it would apply to any ancillary routes developed or used for locatable mineral development.

Impacts from Management Specific to Alternatives I, II, and III

Management specific to Alternatives I, II, and III would result in more constraints to locatable mineral development than the No Action Alternative. These alternatives would require mitigation on soils with severe or very severe potential for wind erosion or with high potential for water erosion. In these areas as well as areas with slopes greater than 20%, an erosion control strategy for mineral exploration and development would be required. Overall, 51% of the planning area would be constrained by these soil resource actions.

Impacts from Management Specific to Alternatives IV, V, and VI (Proposed RMP)

Management specific to Alternatives IV, V, and VI would result in more constraints to locatable mineral development than the No Action Alternative and Alternatives I, II, and III due to more restrictive management being applied to a larger area. Alternatives IV, V, and VI would require mitigation on soils with moderate, severe, or very severe potential for wind erosion or with medium or high potential for water erosion. In these areas as well as areas with slopes between 20% and 40% (46,000 acres), an erosion control strategy for mineral exploration and development would be required. On slopes greater than 40% (22,000 acres), additional mitigation and reclamation would be required. Overall, 99% of the planning area would be constrained by these soil resource actions.

Impacts from Paleontological Resources Actions

Management identified for paleontological resources may constrain locatable mineral development as those activities are likely to affect paleontological resources. Prospecting, exploration, and development of locatable minerals usually involve disturbance and extraction of surface and sub-surface rock formations. This management constraint would only apply where paleontological resources are present. The areas most likely to be affected by management for paleontological resources are those with high or very high potential for paleontological resources: Potential Fossil Yield Classification (PFYC) Classes 4

and 5, respectively. However, because the planning area does not contain any PFYC Class 4 areas, this analysis considers only those areas with very high potential for paleontological resources. Measures taken to reduce or mitigate impacts to paleontological resources would tend to increase costs of locatable mineral development.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would provide for managing paleontological resources to protect, maintain, or enhance sites or areas for their scientific and educational values. Any locatable mineral development in paleontological resource areas would be constrained to the extent the activities would impact those resources; locatable mineral development in areas rated as PFYC Class 5 would be most likely to be affected by this management (121,000 acres).

Impacts from Management Common to All Action Alternatives

Locatable mineral development in paleontological resource areas would be required to implement measures to protect those resources; locatable mineral development in areas rated as PFYC Class 5 would be most likely to be affected by this management (121,000 acres). The degree of constraint on locatable mineral development would be relative to the specific measures required to mitigate impacts to paleontological resources. This management would have a similar level of constraint as the No Action Alternative.

Impacts from Management Specific to Alternatives I, II, III, IV, V, and VI (Proposed RMP)

Management specific to each action alternative pertains only to permits for paleontological research and therefore would not affect locatable mineral development.

Impacts from Visual Resources Actions

Visual Resource Management (VRM) Class allocations prescribe the level of change to the visual landscape that would be allowed in areas within each class. Areas in VRM Class I or II are managed to preserve or retain the existing character of the landscape, which may constrain locatable mineral development by requiring mitigation and special reclamation considerations to return the area to its pre-existing visual character; these measures would tend to increase project costs. Areas in VRM Class IV would have the least constraint on locatable mineral development. Table 4-388 summarizes the impacts to locatable mineral development from visual resources actions.

Table 4-388. Areas with Visual Resource Restrictions that May Affect Locatable Mineral Development by Alternative (Acres)

VRM Class	Alternative						
	No Action	I	II	III	IV	V	VI
Class I and II	240,000	297,000	80,000	81,000	195,000	371,000	167,000

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, 18% of the planning area would be managed to preserve or retain its existing visual character (VRM Class I and II areas); this would result in moderate to major constraints on locatable mineral development within those areas.

Impacts from Management Common to All Action Alternatives

The degree to which ensuring authorized uses are designed to meet Visual Resource Management objectives would affect locatable mineral development would depend on where locatable mineral development occurs. Mining operations in VRM Class I and II areas would have more constraint than those located in VRM Class III and IV areas as reclamation efforts would be required to return the area to its pre-existing visual character.

Impacts from Management Specific to Alternative I

In Alternative I, 22% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on locatable mineral development within those areas.

Impacts from Management Specific to Alternatives II and III

In Alternatives II and III, 6% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on locatable mineral development within those areas.

Impacts from Management Specific to Alternative IV

In Alternative IV, 14% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on locatable mineral development within those areas.

Impacts from Management Specific to Alternative V

In Alternative V, 27% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on locatable mineral development within those areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 12% of the planning area would be managed to preserve or retain its existing visual character; this would result in moderate to major constraints on locatable mineral development within those areas.

Summary of Direct and Indirect Impacts

Overall impacts to locatable mineral development in the planning area are displayed in Table 4-389. For analysis purposes, planning area acres were identified under three subheadings: Accessibility Determined through Locatable Minerals Actions; Constraints Identified from Soil, Paleontological, and Visual Resource Actions; and Overall Accessibility. Under *Accessibility Determined through Locatable Minerals Actions*, acres were identified as accessible, accessible with restrictions, or inaccessible to locatable minerals development. Under *Constraints Identified from Soil, Paleontological, and Visual Resource Actions*, acres with constraints from these sections were identified as to whether they occurred within areas accessible to locatable mineral development or areas accessible with restrictions. To determine overall accessibility, acres within accessible areas that had soil, paleontological, or visual resource constraints were moved from the accessible category to accessible with restrictions. Acres with soil, paleontological, or visual resource constraints within areas accessible with restrictions are captured in the overall accessible with restrictions category, while inaccessible acres remain the same.

Impacts from the No Action Alternative

Within the area accessible for locatable mineral development in the No Action Alternative, 277,000 acres are assumed to be rated as Potential Fossil Yield Classification (PFYC) Class 5 or allocated as Visual Resource Management (VRM) Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 16% of the planning area would be inaccessible, 20% would be accessible with restrictions, and 64% would be accessible. These areas would be further constrained if locatable mineral development would impact soil resources. The No Action Alternative would have the lowest overall levels of constraint of all alternatives. However, this is primarily due to far fewer acres being accessible with restrictions than any of the action alternatives; in contrast, the No Action Alternative would have the largest proportion of the planning area inaccessible of all alternatives.

Overall, there would be no change in the level of constraint on locatable mineral development.

Table 4-389. Summary of Impacts to Locatable Mineral Development in the Planning Area by Alternative (Acres)

	Alternative						
	No Action	I	II	III	IV	V	VI
Accessibility Determined through Locatable Minerals Actions							
Accessible	1,153,000	958,000	983,000	982,000	955,000	979,000	470,000
Accessible with Restrictions	0	284,000	301,000	301,000	274,000	299,000	841,000
Inaccessible	218,000	129,000	86,000	88,000	143,000	99,000	60,000
Constraints Identified from Soil, Paleontological, and Visual Resource Actions [A]							
In Accessible Areas	277,000[B]	582,000	554,000	553,000	950,000	975,000	469,000
In Areas Accessible with Restrictions	0[B]	209,000	124,000	123,000	274,000	284,000	835,000
Overall Accessibility							
Accessible	876,000	374,000	426,000	429,000	4,000	4,000	1,000
Accessible with Restrictions	277,000	868,000	859,000	854,000	1,224,000	1,274,000	1,310,000
Inaccessible	218,000	129,000	86,000	88,000	143,000	99,000	60,000

[A] Footprint acres; many of the acres for soil, paleontological, and visual resource restrictions overlap.
[B] Because the areas with the various mineral restriction categories cannot be mapped for the No Action Alternative, acres with paleontological and visual resource constraints were distributed proportionally across the three categories for the purposes of analysis. This method assumes that the paleontological and visual resource constraints are not correlated with any particular restriction category.

Impacts from Alternative I

Within the area accessible for locatable mineral development in Alternative I, 582,000 acres have severe or very severe potential for wind erosion, have high potential for water erosion, are on slopes greater than 20%, are rated as PFYC Class 5, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 10% of the planning area would be inaccessible, 63% would be accessible with restrictions, and 27% would be accessible. Overall, Alternative I would have fewer areas inaccessible to locatable mineral development than the No Action Alternative but a much larger proportion of the planning area accessible with restrictions.

Overall, there would be a moderate increase in the level of constraint on locatable mineral development.

Impacts from Alternative II

Within the area accessible for locatable mineral development in Alternative II, 554,000 acres have severe or very severe potential for wind erosion, have high potential for water erosion, are on slopes greater than 20%, are rated as PFYC Class 5, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 6% of the planning area would be inaccessible, 63% would be accessible with restrictions, and 31% would be accessible. Overall, Alternative II would have the least constraint on locatable mineral development of the action alternatives. Even though the acres accessible with restrictions would be similar to Alternative I, fewer areas would be inaccessible to locatable mineral development.

Overall, there would be a minor increase in the level of constraint on locatable mineral development.

Impacts from Alternative III

Within the area accessible for locatable mineral development in Alternative III, 553,000 acres have severe or very severe potential for wind erosion, have high potential for water erosion, are on slopes greater than 20%, are rated as PFYC Class 5, or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 6% of the planning area would be inaccessible, 62% would be accessible with restrictions, and 32% would be accessible. Overall,

the levels of constraint on locatable mineral development in Alternative III would be similar to Alternative II but lower than in Alternative I.

Overall, there would be a minor increase in the level of constraint on locatable mineral development.

Impacts from Alternative IV

Within the area accessible for locatable mineral development in Alternative IV, 950,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%; are rated as PFYC Class 5; or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 10% of the planning area would be inaccessible, 89% would be accessible with restrictions, and less than 1% would be accessible. Alternative IV would have the second highest overall levels of constraint on locatable mineral development after Alternative VI.

Overall, there would be a major increase in the level of constraint on locatable mineral development.

Impacts from Alternative V

Within the area accessible for locatable mineral development in Alternative V, 975,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%; are rated as PFYC Class 5; or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 7% of the planning area would be inaccessible, 93% would be accessible with restrictions, and less than 1% would be accessible. Along with Alternative IV, Alternative V would have the second highest overall levels of constraint on locatable mineral development, although fewer areas would be inaccessible as compared to Alternative IV.

Overall, there would be a major increase in the level of constraint on locatable mineral development.

Impacts from Alternative VI (Proposed RMP)

Within the area accessible for locatable mineral development in Alternative VI, 469,000 acres have moderate, severe, or very severe potential for wind erosion; have medium or high potential for water erosion; are on slopes greater than 20%; are rated as PFYC Class 5; or are allocated as VRM Class I or II, making these areas accessible with restrictions. Integrating constraints from each section, locatable minerals on 4% of the planning area would be inaccessible, 96% would be accessible with restrictions, and less than 1% would be accessible. Alternative VI would have the highest overall levels of constraint on locatable mineral development, although fewer acres would be inaccessible as compared to Alternatives IV and V.

Overall, there would be a major increase in the level of constraint on locatable mineral development.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area for locatable mineral development includes portions of the lands contained within the BLM's Bruneau, Burley, Four Rivers, Jarbidge, and Owyhee Field Offices. These areas have similar geology and locatable mineral potential as the planning area (Bond et al., 1978; Hubbard, 1959).

Past, present, and reasonably foreseeable actions for the following resource use cumulatively affects locatable mineral development:

- Minerals.

These actions are described in the *Introduction* to this chapter. In addition, past actions that have affected or constrained locatable mineral development on Federal mineral estate within this region include the Owyhee RMP (BLM, 1999b), Bruneau Management Framework Plan (MFP) (BLM, 1983), and the Twin

Falls MFP (BLM, 1982) to the extent those existing plans constrain or restrict locatable mineral development. The Bruneau Field Office is currently developing a new RMP; however, as of this printing, this plan is still at the pre-draft stage. The Burley Field Office is scheduled to begin an RMP planning process within the next few years. These new RMPs may modify the type and location of constraints on locatable mineral development; however, type and extent of those changes, if any, are not known at this time.

Many lands within these field offices are recommended for withdrawal from location under the general mining laws. Some lands within these field offices have already been withdrawn. As in the analysis of direct and indirect impacts, for the purposes of the cumulative impacts analysis, it is assumed that any areas recommended for withdrawal in these documents will be withdrawn. As a result, locatable minerals on acres recommended for withdrawal as well as those already withdrawn are assumed to be inaccessible. Also, some lands within these field offices may have additional mitigation or reclamation requirements; because these restrictions cannot be quantified, for this analysis, it is assumed these lands do not have additional restrictions.

The 1999 Owyhee RMP specifies several types of restriction on locatable mineral development within the Owyhee Field Office. Areas in the Owyhee Field Office that have been withdrawn or recommended for withdrawal, include the Oregon National Historic Trail; several Special Recreation Management Areas, Areas of Critical Environmental Concern, and Wild and Scenic River (WSR) segments; and canyons in bighorn sheep habitat. The remainder of the Owyhee Field Office is available for locatable mineral development.

The 1983 Bruneau MFP specifies that the Bruneau Field Office should provide opportunities for exploration and development of locatable minerals, unless withdrawn from the 1872 mining laws. A total of 316,000 acres have been withdrawn; areas under withdrawal include bighorn sheep habitat, Wilderness areas, and the WSR corridors of the Owyhee and Bruneau Rivers.

The 1982 Twin Falls MFP provides management direction for the Twin Falls County portion of the Burley Field Office. This MFP segregates 400 acres of historic and geologic sites from locatable mineral development; the remainder of the area is available for locatable mineral development.

Past action in the Four Rivers Field Office includes the 1993 legislation to create the Snake River Birds of Prey National Conservation Area (NCA) (Public Law 103-64). This legislation withdrew the entire NCA from location under the general mining laws.

Locatable mineral development on State of Idaho mineral estate is administered by the Idaho Department of Lands. Locatable mineral development is allowed on State mineral estate; however, the 1971 Surface Mining Act requires an approved reclamation plan and performance bond for each mining operation (IDL, 2009c). Restrictions on locatable mineral development on State land beyond these requirements are determined on a case-by-case basis at the time an application is received if they are deemed necessary (Lomkin, 2009). However, 960 acres in the cumulative impact analysis area are unlikely to be approved for locatable mineral development due to an existing US Air Force lease (Lomkin, 2009). For the purposes of this analysis, it is assumed that locatable minerals on all other State lands are accessible.

Where the mineral estate is owned by private entities, those entities may place restrictions or constraints on locatable mineral development; however, the type and extent of those restrictions, if any, are unknown. For the purposes of analysis, it is assumed that private entities are likely to impose at least some level of restriction on locatable mineral development and therefore, that any locatable minerals contained on those lands are accessible with restrictions.

Table 4-390 describes the constraints on locatable mineral development on mineral estate within the region, excluding BLM-managed lands within the planning area. Overall, locatable minerals on 63% of the mineral estate within the region are accessible, 17% are accessible with restrictions, and 20% are inaccessible.

Table 4-390. Summary of Constraints on Locatable Mineral Development in the Region, excluding the Planning Area (Acres)

Mineral Estate Management	Mineral Estate	Accessible	Accessible with Restrictions	Inaccessible[A]
BLM				
Owyhee Field Office	1,409,000	1,228,000	0	181,000
Bruneau Field Office	1,543,000	1,227,000	0	316,000
Birds of Prey NCA	514,000	0	0	514,000
Burley Field Office (Twin Falls County only)	368,000	367,000	0	400
Other				
State of Idaho [B]	391,000	390,000	0	960
Private [B]	854,000	0	854,000	0
Total	**1,245,000**	**390,000**	**854,000**	**960**

[A] Inaccessible acres include those acres withdrawn from mineral entry, recommended for withdrawal in RMPs, and segregated from mineral entry in MFPs.
[B] Includes those entities' mineral estate within the planning area and the rest of the region.

Summary of Cumulative Impacts

Table 4-391 summarizes the cumulative impacts of the alternatives on locatable mineral development. Overall, the No Action Alternative would have the fewest cumulative impacts on locatable mineral development in the region, followed by Alternatives I, II, and III. Alternatives IV, V, and VI would have the most cumulative impacts on locatable mineral development. However, the differences between the alternatives would be primarily due to differences in areas accessible with restrictions; when considered in the regional context, the differences in inaccessible acres between alternatives would be relatively small.

Table 4-391. Areas Available in the Region for Locatable Mineral Development by Alternative (Acres)

Amount of Constraint	Alternative						
	No Action	I	II	III	IV	V	VI
Accessible							
Planning Area [A]	876,000	374,000	426,000	429,000	4,000	4,000	1,000
Rest of Region	3,212,000	3,212,000	3,212,000	3,212,000	3,212,000	3,212,000	3,212,000
Total	**4,088,000**	**3,586,000**	**3,638,000**	**3,641,000**	**3,216,000**	**3,216,000**	**3,213,000**
Accessible with Restrictions							
Planning Area [A]	277,000	868,000	859,000	854,000	1,224,000	1,274,000	1,310,000
Rest of Region	854,000	854,000	854,000	854,000	854,000	854,000	854,000
Total	**1,131,000**	**1,722,000**	**1,713,000**	**1,708,000**	**2,078,000**	**2,128,000**	**2,164,000**
Inaccessible							
Planning Area [A]	218,000	129,000	86,000	88,000	143,000	99,000	60,000
Rest of Region	1,012,000	1,012,000	1,012,000	1,012,000	1,012,000	1,012,000	1,012,000
Total	**1,230,000**	**1,141,000**	**1,098,000**	**1,100,000**	**1,155,000**	**1,111,000**	**1,072,000**

[A] Only includes BLM-managed lands within the planning area.

Cumulative Impacts from the No Action Alternative

If the No Action Alternative continues to be implemented, 64% of the mineral estate in the region would remain accessible for locatable mineral development, while 17% would continue to be accessible with restrictions and 19% would continue to be inaccessible. The No Action Alternative would not increase the proportion of the region inaccessible for locatable mineral development or accessible with restrictions and therefore, would have the fewest cumulative impacts to locatable mineral development in the region of all the alternatives.

Cumulative Impacts from Alternative I

If Alternative I is implemented, 56% of the mineral estate in the region would be accessible for locatable mineral development, while 27% would be accessible with restrictions and 17% would be inaccessible. Alternative I would have more cumulative impacts on locatable mineral development than the No Action Alternative, but would be similar to Alternatives II and III in having the fewest cumulative impacts of the action alternatives.

Cumulative Impacts from Alternative II

If Alternative II is implemented, 56% of the mineral estate in the region would be accessible for locatable mineral development, while 27% would be accessible with restrictions and 17% would be inaccessible. Alternative II would have more cumulative impacts on locatable mineral development than the No Action Alternative, but would be similar to Alternatives I and III in having the fewest cumulative impacts of the action alternatives.

Cumulative Impacts from Alternative III

If Alternative III is implemented, 56% of the mineral estate in the region would be accessible for locatable mineral development, while 26% would be accessible with restrictions and 18% would be inaccessible. Alternative III would have more cumulative impacts on locatable mineral development than the No Action Alternative, but would be similar to Alternatives I and II in having the fewest cumulative impacts of the action alternatives.

Cumulative Impacts from Alternative IV

If Alternative IV is implemented, 50% of the mineral estate in the region would be accessible for locatable mineral development, while 32% would be accessible with restrictions and 18% would be inaccessible. Along with Alternatives V and VI, Alternative IV would have the most cumulative impacts on locatable mineral development of all the alternatives.

Cumulative Impacts from Alternative V

If Alternative V is implemented, 50% of the mineral estate in the region would be accessible for locatable mineral development, while 33% would be accessible with restrictions and 17% would be inaccessible. Along with Alternatives IV and VI, Alternative V would have the most cumulative impacts on locatable mineral development of all the alternatives.

Cumulative Impacts from Alternative VI (Proposed RMP)

If Alternative VI is implemented, 50% of the mineral estate in the region would be accessible for locatable mineral development, while 33% would be accessible with restrictions and 17% would be inaccessible. Along with Alternatives IV and V, Alternative VI would have the most cumulative impacts on locatable mineral development of all the alternatives.

4.5. SPECIAL DESIGNATIONS

4.5.1. Areas of Critical Environmental Concern

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to Areas of Critical Environmental Concern (ACECs):

- **Acres containing values meeting ACEC relevance and importance criteria that would receive special management to maintain or enhance those values through ACEC designation** – ACEC designation is a management decision that impacts relevant and important values in existing and nominated ACECs that are designated as well as those that are not designated. Thus, the affected components of ACECs are the values that meet criteria for relevance and importance under any existing or nominated ACEC, rather than the ACEC designation itself. The alternatives vary in the degree to which they provide special management to maintain or enhance those values.

Methods and Assumptions

ACEC designation indicates that an area has values that meet criteria for relevance and importance and that special management has been established to protect those values. These values include historic, cultural, and scenic values; fish and wildlife resources; and natural systems or processes. Management associated with an ACEC designation is specific to the relevant and important values present in the ACEC. This special management is designed to provide proactive measures to maintain or enhance those values as well as measures necessary to protect those values from impacts of future activities.

This section analyzes how much of the area with values that meet relevance and importance criteria would receive special management through ACEC designation. To determine impacts for each alternative, the acres or miles of each relevant and important value that would be within a designated ACEC were calculated. The amount of that value receiving special management was compared for each alternative to determine the relative amount of special management the alternatives would provide for each value.

Impacts to ACECs from management in the *ACEC* section of Chapter 2 were analyzed in detail. This analysis focuses on whether or not special management is provided and assumes that any special management is more beneficial to a value than no special management. This section does not, however, analyze what the specific impacts of that special management are, nor does it analyze how areas with relevant and important values that do not receive special management are affected. These analyses can be found in the sections related to each relevant and important value (e.g., impacts to scenic values are analyzed under *Visual Resources*; impacts to sage-grouse are analyzed under *Special Status Wildlife*). Impacts from management for ACECs can be found under *Impacts from Areas of Critical Environmental Concern Actions* in the *Geologic Features*, *Water Resources*, *Upland Vegetation*, *Riparian Areas and Wetlands*, *Fish*, *Wildlife*, *Special Status Plants*, *Special Status Fish and Aquatic Invertebrates*, *Special Status Wildlife*, *Noxious Weeds and Invasive Plants*, *Paleontological Resources*, *Cultural Resources*, *Visual Resources*, *Livestock Grazing*, *Recreation*, *Transportation and Travel*, *Wild and Scenic Rivers,* and *Wilderness Study Area* sections.

The following assumptions were used to analyze impacts to values meeting criteria for relevance and importance:

- ACECs are designated to maintain or enhance the relevant and important values contained within each area.
- Management actions associated with each ACEC designation are specific to the relevant and important values within that ACEC and are designed to maintain or enhance those values. None of

the special management for an ACEC would decrease the amount or condition of the relevant and important values within that area.

- If an area containing values meeting relevance and importance criteria is not designated as an ACEC, there would be greater risk that the amount or condition of those values would decrease. However, the risk would be dependent on how those areas would be managed without the ACEC designation.

Direct and Indirect Impacts

Impacts from Areas of Critical Environmental Concern Actions

Acres containing relevant and important values that would receive special management through ACEC designation in each alternative are displayed in Table 4-392, and Appendix M contains full descriptions of these relevant and important values. Relevant and important values contained in these areas are expected to be maintained or enhanced. Relevant and important values without special management would be at higher risk for decreases in the amount or condition of those values due to the other management prescribed in the alternative; the risk would be site-specific depending on the management prescribed for other resources and uses. Areas containing relevant and important values within other special designations, such as wilderness, Wilderness Study Area, and Wild and Scenic River (WSR) corridors would likely have lower risk than those without another special designation. The risk may also be lower for values that already have higher management priority due to law, regulation, or policy, such as special status species and cultural resources.

Table 4-392. Areas with Values Meeting Relevance and Importance Criteria with Area of Critical Environmental Concern Designation by Alternative (Acres or Miles)

Value	Total	Alternative							
		No Action	I	II	III	IV		V	VI
						IV-A	IV-B		
Historic Values (acres of Oregon National Historic Trail protective zone, Kelton and Toana Freight Roads protective corridors)	27,000	250	380	0	380	380	380	380	380
Cultural Values (acres of high cultural resource density zone)	673,000	79,000	79,000	0	54,000	245,000	175,000	613,000	19,000
Scenic Values (acres of Visual Resource Inventory Class 1)	70,000	49,000	49,000	0	59,000	65,000	65,000	NA	4,000
Fish or Wildlife Resources									
Bruneau Hot Springsnail (miles of habitat)	2.6	0	2.1	0	0	2.1	2.1	2.1	0
Snake River Snails (Snake River mileage)	20	0	11	0	NA	NA	NA	11	NA
White Sturgeon (Snake River mileage)	20	0	11	0	NA	NA	NA	11	NA
Bull Trout (miles of critical habitat)	89	77	77	0	43	84	84	70	0
Redband Trout (miles of occupied streams)	250	128	128	0	80	148	107	201	45
Columbia Spotted Frog (miles of streams with observations)	5	0	0	0	0	5	0	5	0

Value	Total	Alternative							
		No Action	I	II	III	IV		V	VI
						IV-A	IV-B		
Fish or Wildlife Resources									
Sage-Grouse (acres of key habitat)	311,000	NA	NA	0	NA	94,000	49,000	302,000	NA
California Bighorn Sheep (acres of bighorn habitat)	49,000	41,000	41,000	0	29,000	45,000	45,000	49,000	9,000
Natural System or Process									
Slickspot Peppergrass (acres of occupied habitat [A, B])	24,000	0	0	0	0	24,000	20,000	24,000	0
Davis Peppergrass (acres of habitat [A])	150	30	30	0	20	120	120	150	10
Bruneau River Phlox (acres of habitat [A])	370	240	310	0	250	310	310	320	0
Special Status Plants Assemblages (acres of Packard's cowpie buckwheat, spine-node milkvetch, rigid threadbush, spreading gilia, white margin waxplant, calcareous buckwheat, Greeley's wavewing, Janish penstemon, matted cowpie buckwheat, and Snake River milkvetch [A])	500	NA	280	0	NA	110	110	280	100
Upland Vegetation (acres that have not burned since 1987)	451,000	3,000	3,000	0	3,000	102,000	56,000	NA	3,000
Riparian Systems (miles of free flowing streams in the Bruneau-Jarbidge River System)	109	96	96	0	48	104	104	NA	14
Paleontologic and Geologic Resources (acres of Potential Fossil Yield Classification [PFYC] Class 5)	121,000	300	800	0	500	800	800	500	800
Thermal Springs and Seeps [C]	2.6	0	2.1	0	0	2.1	2.1	2.1	0

Note: Values marked as NA are present but they do not meet relevance and importance criteria.
[A] Extensive surveys have not been conducted for special status plant species, acres depicted likely over estimate actual presence.
[B] Calculation does not include a half mile habitat integrity buffer.
[C] Thermal springs and seeps are largely un-mapped in the Lower Bruneau Canyon; miles of habitat for Bruneau hot springsnail was used in the analysis.

Impacts from Management Specific to the No Action Alternative

In the No Action Alternative, the three existing ACECs would remain designated. The three existing ACECs include: Bruneau-Jarbidge, Salmon Falls Creek, and Sand Point. These ACECs encompass 89,000 acres; approximately 6% of the planning area. Designated ACECs would overlap 73% of the Bruneau-Jarbidge Rivers Wilderness and 99% of the designated WSR corridors.

In the No Action Alternative, the three existing ACECs would remain designated. As a result, the following proportions of lands containing relevant and important values would receive special management:

- Less than 1% of lands with historic values,
- 12% of lands with cultural values,
- 67% of lands with scenic values,
- 87% of lands with bull trout values,
- 51% of lands with redband trout values,
- 84% of lands with bighorn sheep values,
- 20% of lands with Davis peppergrass,
- 65% of lands with Bruneau River phlox values,
- Less than 1% of lands with upland vegetation values,
- 88% of lands with riparian system values, and
- Less than 1% of lands with paleontologic and geologic resources.

None of the lands containing the following relevant and important values would receive special management from ACEC designation:

- Bruneau hot springsnail,
- Sage-grouse,
- Slickspot peppergrass,
- Snake River snails,
- Special status plant assemblages,
- Spotted frog,
- Thermal springs and seeps, and
- White sturgeon.

Impacts from Management Specific to Alternative I

In Alternative I, the three existing ACECs would remain designated; however, the boundary of the Sand Point ACEC would be expanded. Two new ACECs would be designated as well: Lower Bruneau Canyon (large boundary) and Middle Snake. These ACECs would encompass 97,000 acres; approximately 7% of the planning area. Designated ACECs would overlap 73% of the Bruneau-Jarbidge Rivers Wilderness and 100% of the designated WSR corridors.

As a result, the following proportions of lands containing relevant and important values would receive special management:

- 1% of lands with historic values,
- 12% of lands with cultural values,
- 72% of lands with scenic values,
- 81% of lands with Bruneau hot springsnail values,
- 55% of lands with Snake River snail values,
- 55% of lands with white sturgeon values,
- 87% of lands with bull trout values,
- 51% of lands with redband trout values,
- 84% of lands with bighorn sheep values,
- 20% of lands with Davis peppergrass,
- 84% of lands with Bruneau River phlox values,
- 56% of lands with special status plant assemblage values,
- Less than 1% of lands with upland vegetation values,
- 88% of lands with riparian system values,
- Less than 1% of lands with paleontologic and geologic values, and
- 81% of lands with thermal spring and seep values.

None of the lands containing the following relevant and important values would receive special management from ACEC designation:

- Sage-grouse,
- Slickspot peppergrass, and
- Spotted frog.

Impacts from Management Specific to Alternative II

In Alternative II, ACEC designation would be removed from the three existing ACECs, and no new ACECs would be designated. As a result, none of the lands containing any relevant and important values would receive special management from ACEC designation.

Impacts from Management Specific to Alternative III

In Alternative III, the three existing ACECs would remain designated. However, the boundary of the Sand Point ACEC would be expanded, and the boundary of the Bruneau-Jarbidge ACEC would be reduced. No new ACECs would be designated. These existing ACECs with boundary modifications would encompass 61,000 acres; approximately 4% of the planning area. Designated ACECs would overlap 93% of the Bruneau-Jarbidge Rivers Wilderness and 82% of the designated WSR corridors.

As a result, the following proportions of lands containing relevant and important values would receive special management:

- 1% of lands with historic values,
- 8% of lands with cultural values,
- 83% of lands with scenic values,
- 48% of lands with bull trout,
- 32% of lands with redband trout values,
- 59% of lands with bighorn sheep values,
- 13% of lands with Davis peppergrass values,
- 68% of lands with Bruneau River phlox values,
- Less than 1% of lands with upland vegetation values,
- 44% of lands with riparian system values, and
- Less than 1% of lands with paleontologic and geologic values.

None of the lands containing the following relevant and important values would receive special management from ACEC designation:

- Bruneau hot springsnail,
- Sage-grouse,
- Slickspot peppergrass,
- Snake River snails,
- Special status plant assemblages,
- Spotted frog,
- Thermal springs and seeps, and
- White sturgeon.

Impacts from Management Specific to Alternative IV

In Alternative IV-A, two existing ACECs would remain designated, and the boundaries of the Bruneau-Jarbidge and Sand Point ACECs would both be expanded. Although ACEC designation would be removed from Salmon Falls Creek ACEC, three new ACECs would be designated: Inside Desert (expanded boundary), Jarbidge Foothills (expanded boundary), and Lower Bruneau Canyon (large boundary). These ACECs would encompass 333,000 acres; approximately 24% of the planning area. Designated ACECs would overlap 100% of the Bruneau-Jarbidge Rivers Wilderness and designated WSR corridors.

As a result, the following proportions of lands containing relevant and important values would receive special management:

- 1% of lands with historic values,
- 36% of lands with cultural values,
- 93% of lands with scenic values,
- 81% of lands with Bruneau hot springsnail values,
- 94% of lands with bull trout values,
- 59% of lands with redband trout values,
- 100% of lands with spotted frog values,
- 30% of lands with sage-grouse values,
- 92% of lands with bighorn sheep values,
- 100% of lands with slickspot peppergrass values,
- 80% of lands with Davis peppergrass values,
- 84% of lands with Bruneau River phlox values,
- 22% of lands with special status plant assemblage values,
- 23% of lands with upland vegetation values,
- 95% of lands with riparian system values,
- Less than 1% of lands with paleontologic and geologic values, and
- 81% of lands with thermal spring and seep values.

None of the lands containing the following relevant and important values would receive special management from ACEC designation:

- Snake River snails and
- White sturgeon.

Alternative IV-B is identical to Alternative IV-A, except the Inside Desert and Jarbidge Foothills ACECs would both have smaller boundaries than in Alternative IV-A. ACECs in Alternative IV-B would encompass 230,000 acres; approximately 17% of the planning area.

As a result, special management for relevant and important values contained in those ACECs would apply to a smaller boundary as follows:

- 26% of lands with cultural values,
- 43% of lands with redband trout values,
- 0% of lands with spotted frog values,
- 16% of lands with sage-grouse values,
- 83% of lands with slickspot peppergrass values, and
- 12% of lands with upland vegetation values.

Impacts from Management Specific to Alternative V

In Alternative V, ACEC designation would be removed from two existing ACECs (Bruneau-Jarbidge and Salmon Falls Creek) because the majority of those areas would be encompassed in the new Sagebrush Sea ACEC designation. The boundary of the Sand Point ACEC would be expanded, and two additional ACECs would be designated: Lower Bruneau Canyon (large boundary) and Middle Snake. These ACECs would encompass 966,000 acres; approximately 70% of the planning area. Designated ACECs would overlap 98% of the Bruneau-Jarbidge Rivers Wilderness and 89% of the designated WSR corridors.

As a result, the following proportions of lands containing relevant and important values would receive special management:

- 1% of lands with historic values,
- 91% of lands with cultural values,
- 81% of lands with Bruneau hot springsnail values,

- 55% of lands with Snake River snail values,
- 55% of lands with white sturgeon values,
- 79% of lands with bull trout values,
- 80% of lands with redband trout values,
- 100% of lands with spotted frog values,
- 97% of lands with sage-grouse values,
- 100% of lands with bighorn sheep values,
- 100% of lands with slickspot peppergrass values,
- 100% of lands with Davis peppergrass values,
- 86% of lands with Bruneau River phlox values,
- 56% of lands with special status plant assemblage values,
- Less than 1% of lands with paleontologic and geologic values, and
- 81% of lands with thermal spring and seep values.

None of the lands containing the following relevant and important values would receive special management from ACEC designation:

- Riparian system,
- Scenic, and
- Upland vegetation.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, two existing ACECs would remain designated, and the boundaries of the Sand Point ACEC would be expanded. Although ACEC designation would be removed from Bruneau-Jarbidge ACEC, two new ACECs would be designated: Lower Bruneau Canyon (small boundary) and Upper Bruneau Canyon. These ACECs would encompass 22,000 acres; approximately 2% of the planning area. Designated ACECs would not overlap with the Bruneau-Jarbidge Rivers Wilderness or designated WSR corridors.

As a result, the following proportions of lands containing relevant and important values would receive special management:

- 1% of lands with historic values,
- 3% of lands with cultural values,
- 6% of lands with scenic values,
- 18% of lands with redband trout values,
- 18% of lands with bighorn sheep values,
- 7% of lands with Davis peppergrass,
- 20% of lands with special status plant assemblage values,
- Less than 1% of lands with upland vegetation values,
- 13% of lands with riparian system values, and
- Less than 1% of lands with paleontologic and geologic values.

None of the lands containing the following relevant and important values would receive special management from ACEC designation:

- Bruneau hot springsnail,
- Bruneau River phlox,
- Bull trout,
- Sage-grouse,
- Shoshone sculpin,
- Slickspot peppergrass,
- Snake river snail,
- Spotted frog,
- Thermal spring and seep, and

- White sturgeon.

Summary of Direct and Indirect Impacts

Impacts from the No Action Alternative

Overall, in the No Action Alternative, 25% of lands containing relevant and important values would receive special management through ACEC designation; as a result, those relevant and important values are likely to be maintained or enhanced. On the remaining lands containing relevant and important values, there is a greater risk that those values will not be maintained than if they had been included in an ACEC designation.

There would be no change in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Impacts from Alternative I

Overall, in Alternative I, 44% of lands containing relevant and important values would receive special management through ACEC designation; as a result, those relevant and important values are likely to be maintained or enhanced. On the remaining lands containing relevant and important values, there is a greater risk that those values will not be maintained than if they had been included in an ACEC designation. Alternative I generally provides more restrictions on uses and more actions to maintain or enhance resource values compared to the No Action Alternative; therefore, the overall risk to these values outside designated ACECs may be lower than the No Action Alternative.

There would be a moderate increase in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Impacts from Alternative II

In Alternative II, ACEC designation would be removed from the three existing ACECs, and no new ACECs would be designated. As a result, none of the lands containing any relevant and important values would receive special management from ACEC designation. Alternative II generally provides fewer restrictions on uses than Alternative I and a similar level of restriction as the No Action Alternative; therefore, the overall risk to these values outside designated ACECs would be similar to the No Action Alternative.

There would be a major decrease in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Impacts from Alternative III

Overall, in Alternative III, 19% of lands containing relevant and important values would receive special management through ACEC designation; as a result, those relevant and important values are likely to be maintained or enhanced. On the remaining lands containing relevant and important values, there is a greater risk that those values will not be maintained than if they had been included in an ACEC designation. Alternative III generally provides a similar level of restriction on uses as Alternative I, but fewer actions to maintain or enhance resource values; therefore, the overall risk to these values outside designated ACECs may be slightly higher than in Alternative I.

There would be a minor decrease in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Impacts from Alternative IV

Overall, in Alternative IV-A, 56% of lands containing relevant and important values would receive special management through ACEC designation; 48% would receive special management in Alternative IV-B. As a result, those relevant and important values are likely to be maintained or enhanced. On the remaining lands containing relevant and important values, there is a greater risk that those values will not be maintained than if they had been included in an ACEC designation. Alternative IV generally provides more restrictions on uses and more actions to maintain or enhance resource values compared to the No

Action Alternative and Alternatives I, II, and III; therefore, the overall risk to these values outside designated ACECs may be lower than in those alternatives.

There would be a major increase in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Impacts from Alternative V

Overall, in Alternative V, 61% of lands containing relevant and important values would receive special management through ACEC designation; as a result, those relevant and important values are likely to be maintained or enhanced. On the remaining lands containing relevant and important values, there is a greater risk that those values will not be maintained than if they had been included in an ACEC designation. Alternative V generally provides a similar level of restriction on uses and actions to maintain or enhance resource values as Alternative IV. However, most of the lands containing those values are within the boundary of the Sagebrush Sea ACEC. Even though they do not meet criteria for relevance and importance within the entire ACEC, the values may benefit from management directed toward other relevant and important values. Therefore, the overall risk to these values outside designated ACECs may be even lower than in Alternative IV.

There would be a major increase in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Impacts from Alternative VI (Proposed RMP)

Overall, in Alternative VI, 5% of lands containing relevant and important values would receive special management through ACEC designation; as a result, those relevant and important values are likely to be maintained or enhanced. On the remaining lands containing relevant and important values, there is a greater risk that those values will not be maintained than if they had been included in an ACEC designation. Alternative VI would not designate ACECs that overlap with the Bruneau-Jarbidge Rivers Wilderness or designated Wild and Scenic River corridors as in all other alternatives. Based on public comment these overlapping designations were removed. Alternative VI generally provides more restrictions on uses and more actions to maintain or enhance resource values compared to the No Action Alternative and Alternatives I, II, and III; therefore, the overall risk to these values outside designated ACECs may be lower than in those alternatives.

There would be a major decrease in the amount of lands containing relevant and important values receiving special management through ACEC designation.

Cumulative Impacts

Cumulative impacts to the relevant and important values contained in existing and potential ACECs are addressed under the relevant Chapter 4 section for that value (e.g., cumulative impacts to cultural values are addressed in the *Cultural Resources* section on cumulative impacts).

4.5.2. National Historic Trails

Analysis Methods

Indicators

The following indicator was used for the analysis of impacts to National Historic Trails (NHTs):

- **The integrity of the historical setting of the Oregon NHT-** Integrity refers to the physical condition of the trail itself and of the adjacent environment. Actions that disturb the trail, affect the viewshed, add new facilities, or add loud and sustained noise could negatively affect the historical and related recreational values associated with the trail. In addition, actions that substantially interfere with (i.e., hinder or obstruct) the nature and purposes of the trail would impact the values for which the trail was designated. Actions that reduce or eliminate physical, visual, and acoustic impacts in the vicinity of the trail would help preserve those values.

Methods and Assumptions

Impacts to NHTs from management in the following sections of Chapter 2 were analyzed in detail: *National Historic Trails*, *Upland Vegetation*, *Noxious Weeds and Invasive Plants*, *Visual Resources*, *Livestock Grazing*, and *Land Use Authorizations*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for NHTs.

The Oregon Trail is the only NHT in the planning area. Each alternative would create a National Trail Management Corridor in accordance with BLM Manual 6280, Management of National Scenic and Historic Trails. The width of the corridor varies by alternative but each contains a more intensively managed protective zone which extends 0.25 miles on either side of the trail. The corridor and protective zone surround 47 miles of BLM-managed segments of the Oregon NHT within the planning area. In the No Action Alternative and Alternative II, the National Trail Management Corridor and the protective zone are the same resulting in 11,000 acres of BLM-managed trail and corridor. For Alternatives I, III, IV, and V the National Trail Management Corridor is three miles wide (one and a half miles on either side of the trail) resulting in a 42,000 acre corridor. The National Trail Management Corridor in Alternative VI is four miles wide (two miles on either side of the trail) resulting in a 52,000 acre corridor. The visual foreground, a critical component of the visual setting of the trail, is three miles on either side of the Oregon NHT. The combined corridor and foreground acreage is 75,000 acres for each alternative.

Direct impacts to the Oregon NHT can result from a variety of actions or factors, including:

- Disturbing the soil or vegetation within trail corridors;
- Altering the characteristics of the immediate or surrounding environment or elements of the trail that contribute to its significance such as important landscape features mentioned or recorded in emigrant diaries or journals;
- Introducing visual or acoustic elements that are out of character with the landscape or historic setting of the trail or that affect trail user's enjoyment of the trail; or
- Neglecting the resource to the extent that historic, recreational, or natural environmental values associated with the trail are deteriorated.

Actions such as data collection or preservation of the setting or historical context of the NHT will maintain or enhance trail values.

Assumptions used in this analysis include the following:

- Protection of the Oregon NHT segments and related sites occur in accordance with Federal laws and BLM regulations and policy, regardless of whether they are specifically identified in Chapter 2.
- Actions and allocations which maintain or enhance the integrity of the designated route and associated setting of the Oregon NHT will protect trail resources, qualities, and values, support the trail's primary uses, and help achieve the nature and purposes for which the trail was designated.
- Certain projects, due to size or topography, may require consideration of visual intrusions into the setting beyond the foreground to comply with Section 106 of the National Historic Preservation Act.

Direct and Indirect Impacts

Impacts from National Historic Trail Actions

Impacts from Management Specific to the No Action Alternative

Management of the Oregon National Historic Trail (NHT) in accordance with existing law, regulation, and policy would maintain or enhance trail characteristics.

Impacts from Management Common to All Action Alternatives

Management actions proposed in the action alternatives would maintain the physical, visual, and acoustic setting of the Oregon NHT and achieve NHT objectives by conserving and protecting trail resources, qualities, values, associated settings, and primary uses through reducing uses that substantially interfere

with the nature and purposes of the trail and avoiding activities that are incompatible with the purposes for which the NHT was established.

All action alternatives would manage the Oregon NHT protective zone as Visual Resource Management Class II. This would maintain the visual setting in the immediate vicinity of the Oregon NHT.

Impacts from Upland Vegetation Actions

Management that prioritizes vegetation treatments that convert annual communities to native shrubland in the Oregon National Historic Trail (NHT) protective zone would restore historical vegetative context, maintaining or enhancing the physical setting of the Oregon NHT.

Impacts from Management Specific to the No Action Alternative

The Oregon NHT would not be targeted as a priority for vegetation treatments in the No Action Alternative. The absence of proactive shrubland restoration is less likely to enhance the physical setting than management that prioritizes these areas for treatment. Although lack of prioritization does not necessarily decrease the quality of the physical setting of the Oregon NHT, persistence of or conversion to annual communities does not represent or contribute to the historical vegetative context of the trail. Under the No Action Alternative, the integrity of the historical setting of the Oregon NHT is expected to remain stable or decline.

Impacts from Management Specific to Alternatives I, V, and VI (Proposed RMP)

Alternatives I, V, and VI would prioritize the Oregon NHT for treatment of annual communities to restore native shrubland. This would enhance the physical setting within the protective zone by restoring the historical vegetative context. Under these alternatives, the integrity of the historical and recreational setting of the Oregon NHT is expected to improve.

Impacts from Management Specific to Alternatives II, III, and IV

There is no management specific to Alternatives II, III, or IV that directly targets the Oregon NHT for vegetation treatments although, in general, vegetation treatments under these alternatives are aimed at maintaining or increasing native plant communities. The absence of proactive shrubland restoration is less likely to enhance the physical setting than management that prioritizes these areas for treatment. Although lack of prioritization does not necessarily decrease the quality of the physical setting of the Oregon NHT, persistence of or conversion to annual communities does not represent or contribute to the historical vegetative context of the trail. Impacts under these alternatives would be similar to the No Action Alternative.

Impacts from Noxious Weeds and Invasive Plants Actions

Management that prioritizes noxious weeds and invasive plant treatments in the Oregon National Historic Trail (NHT) protective zone would contribute to restoration of historical vegetative context.

Impacts from Management Specific to the No Action Alternative and Alternative II

Neither the No Action Alternative nor Alternative II specifies the Oregon NHT for treatment of noxious weeds or invasive plants. The absence of proactive noxious weed and invasive plant treatment is less likely to enhance the physical setting than management that prioritizes these areas for treatment. Although lack of prioritization does not necessarily decrease the quality of the physical setting of the Oregon NHT, persistence of or conversion to noxious weeds or invasive plants would not contribute to the historical vegetative context of the trail nor maintain the integrity of the historical setting.

Impacts from Management Specific to Alternatives I, III, IV, V, and VI (Proposed RMP)

Alternatives I, III, IV, V, and VI identify special designations, including the Oregon NHT, as priority treatment areas. This would maintain or improve the physical integrity of the historical setting by protecting the historical vegetative context of the trail corridor.

Impacts from Visual Resource Actions

Designation of the Oregon National Historic Trail (NHT) protective zone as Visual Resource Management (VRM) Class I or II would maintain the historical visual context of the immediate trail route. Designation of the remaining National Trail Management Corridor and foreground area as VRM Class I and II would limit visual modifications in the area surrounding the trail and provide additional management to maintain the visual character.

Impacts from Management Specific to the No Action Alternative

Table 4-393 identifies the number of acres in each VRM Class for the Oregon NHT National Trail Management Corridor and visual foreground in the No Action Alternative. The No Action Alternative contains management for the Oregon NHT protective zone and foreground that would maintain or improve the visual setting on 36% of the combined area. Alterations to the visual setting would be allowed in the remaining 64%.

Table 4-393. Visual Resource Management Classes for the Oregon National Historic Trail Corridor and Foreground in the No Action Alternative (Acres)

	VRM Class			
	I	II	III	IV
Corridor Acres [A]	10,000	1,000	0	100
Foreground Acres	10,000	6,000	2,000	46,000

[A] The protective zone and management corridor are the same in this alternative.

Impacts from Management Specific to Alternatives I and III

Table 4-394 identifies the number of acres in each VRM Class for the Oregon NHT corridor and foreground in Alternatives I and III. These alternatives assign the Oregon NHT protective zone to VRM Class II, with the exception of an identified utility right-of-way (ROW) corridor which is VRM Class III. Most of the National Trail Management Corridor outside the protective zone would be VRM Class III. The remaining foreground, outside the NHT corridor, would be mostly VRM Class IV (63%). This would maintain or improve the visual setting on 12% of the corridor and foreground. Decreases in visual resources would be anticipated on 88% of the area, primarily resulting from structures and facilities associated with existing utility corridors.

Table 4-394. Visual Resource Management Classes for the Oregon National Historic Trail Corridor and Foreground in Alternatives I and III (Acres)

	VRM Class			
	I	II	III	IV
Corridor Acres	0	9,000	30,000	2,000
Foreground Acres	0	0	13,000	22,000

Impacts from Management Specific to Alternative II

Table 4-395 identifies the number of acres in each VRM Class for the Oregon NHT corridor and foreground in Alternative II. Alternative II contains management for the Oregon NHT protective zone, corridor, and foreground that would maintain or improve the visual setting on 12% of the combined area. Alterations to the visual setting would be allowed in the remaining 88%. This alternative varies from the other action alternatives in the high number of foreground acres (95%) which would be managed as VRM Class IV instead of Class III, allowing more change to the visual setting of the foreground. Alternative II provides the least protection for the visual setting of the Oregon NHT of all the alternatives.

Table 4-395. Visual Resource Management Classes for the Oregon National Historic Trail Corridor and Foreground in Alternative II (Acres)

	VRM Class			
	I	II	III	IV
Corridor Acres [A]	0	9,000	2,000	0
Foreground Acres	0	0	3,000	61,000

[A] The protective zone and management corridor are the same in this alternative.

Impacts from Management Specific to Alternative IV

Table 4-396 identifies the number of acres in each VRM Class for the Oregon NHT corridor and foreground in Alternative IV. This alternative assigns the Oregon NHT protective zone to VRM Class II, with the exception of an identified utility ROW corridor which is VRM Class III. All of the National Trail Management Corridor outside the protective zone would be VRM Class III. The remaining foreground, outside the NHT corridor, would be mostly VRM Class IV (60%). This would maintain or improve the visual setting on 12% of the corridor and foreground. Decreases in visual resources would be anticipated on 88% of the area, primarily resulting from structures and facilities associated with existing utility ROW corridors.

Table 4-396. Visual Resource Management Classes for the Oregon National Historic Trail Corridor and Foreground in Alternative IV (Acres)

	VRM Class			
	I	II	III	IV
Corridor Acres	0	9,000	31,000	0
Foreground Acres	0	0	14,000	21,000

Impacts from Management Specific to Alternative V

Table 4-397 identifies the number of acres in each VRM Class for the Oregon NHT corridor and foreground in Alternative V. This alternative assigns the Oregon NHT protective zone to VRM Class II, with the exception of an identified utility ROW corridor which is VRM Class III. Almost all of the National Trail Management Corridor outside the protective zone would be VRM Class III. The remaining foreground, outside the NHT corridor, would be mostly VRM Class IV (88%). This would maintain or improve the visual setting on 12% of the corridor and foreground. Decreases in visual resources would be anticipated on 88% of the area, primarily resulting from structures and facilities associated with existing utility ROW corridors.

Table 4-397. Visual Resource Management Classes for the Oregon National Historic Trail Corridor and Foreground in Alternative V (Acres)

	VRM Class			
	I	II	III	IV
Corridor Acres	0	9,000	32,000	0
Foreground Acres	0	0	4,000	30,000

Impacts from Management Specific to Alternative VI (Proposed RMP)

Table 4-398 identifies the number of acres in each VRM Class for the Oregon NHT corridor and foreground in Alternative VI. This alternative assigns the Oregon NHT protective zone and National Trail Management Corridor to VRM Class II, with the exception of identified utility ROW corridors which are VRM Class III. The remaining foreground, outside the NHT corridor, would be mostly VRM Class IV (84%). This would maintain or improve the visual setting on 49% of the corridor and foreground. Decreases in visual resources would be anticipated on 51% of the area, primarily resulting from structures and facilities associated with existing utility ROW corridors. Alternative VI provides the most protection for the visual setting of the Oregon NHT among all alternatives.

Table 4-398. Visual Resource Management Classes for the Oregon National Historic Trail Corridor and Foreground in Alternative VI (Proposed RMP) (Acres)

	VRM Class			
	I	II	III	IV
Corridor Acres	0	37,000	13,000	20
Foreground Acres	0	0	4,000	21,000

Impacts from Livestock Grazing Actions

Management that allocates land within the Oregon National Historic Trail (NHT) corridor as unavailable for grazing would maintain or enhance trail values by avoiding impacts from livestock grazing or grazing infrastructure. Changes in the physical setting of Oregon NHT resources would result from grazing infrastructure; vegetation alterations from trailing, watering, or salting; and concentrated congregation of livestock. Decreases in the integrity of the Oregon NHT historical setting due to livestock grazing will be less likely where the protective zone and trail corridor are unavailable for grazing.

Impacts from Management Specific to the No Action Alternative and Alternative II

The No Action Alternative and Alternative II would allocate 12% of the Oregon NHT protective zone/trail corridor and 7% of the visual foreground as unavailable for livestock grazing. These proportions are similar to Alternatives III, IV, and VI. Livestock related changes to the physical, visual, or acoustic settings of the Oregon NHT are not anticipated in areas that are unavailable for grazing.

Impacts from Management Specific to Alternative I

Alternative I would allocate 15% of the Oregon NHT protective zone, 13% of the trail corridor, and 19% of the visual foreground as unavailable for livestock grazing. Only Alternative V would make more acres surrounding the NHT unavailable for livestock. Livestock related changes to the physical, visual, or acoustic settings of the Oregon NHT are not anticipated in areas that are unavailable for grazing. Impacts to the historical setting of the NHT from livestock grazing would decrease in relation to the No Action Alternative and Alternatives II, III, IV, and VI.

Impacts from Management Specific to Alternative III

Alternative III would allocate 12% of the Oregon NHT protective zone, 9% of the trail corridor, and 7% of the visual foreground as unavailable for livestock grazing. It is very similar to the No Action Alternative and Alternatives II and VI. Livestock related changes to the physical, visual, or acoustic settings of the Oregon NHT are not anticipated in areas that are unavailable for grazing.

Impacts from Management Specific to Alternative IV

Alternative IV would allocate 13% of the Oregon NHT protective zone, 11% of the trail corridor, and 7% of the visual foreground as unavailable for livestock grazing. These proportions are slightly higher than the No Action Alternative and Alternatives II, III, and VI but lower than Alternatives I and V. Livestock related changes to the physical, visual, or acoustic settings of the Oregon NHT are not anticipated in areas that are unavailable for grazing.

Impacts from Management Specific to Alternative V

Alternative V would allocate 46% of the Oregon NHT protective zone, 32% of the trail corridor, and 17% of the visual foreground as unavailable for livestock grazing. This is a much larger proportion than the No Action Alternative and Alternatives I, II, III, IV, and VI. Livestock related changes to the physical, visual, or acoustic settings of the Oregon NHT are not anticipated in areas that are unavailable for grazing. Impacts to the historical setting of the NHT from livestock grazing would decrease in relation to all the other alternatives.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would allocate 12% of the Oregon NHT protective zone, 9% of the trail corridor, and 6% of the visual foreground as unavailable for livestock grazing. These proportions are slightly higher than the No Action Alternative and Alternative II, about the same as Alternative III, but lower than Alternatives I, IV,

and V. Livestock related changes to the physical, visual, or acoustic settings of the Oregon NHT are not anticipated in areas that are unavailable for grazing.

Impacts from Land Use Authorizations Actions

Permanent facilities and construction and maintenance activities associated with land use authorizations would adversely change the integrity of the physical and visual setting of the Oregon National Historic Trail (NHT). These settings will be maintained or improved within right-of-way (ROW) avoidance or exclusion areas.

Short-term impacts to NHT resources resulting from land use authorizations would include surface-disturbing activities and presence of equipment and personnel during construction or maintenance activities of approved authorizations. This would alter the physical, visual, and acoustic setting associated with the historical context of the Oregon NHT through the duration of these activities. Actions that would occur within the trail corridor would be analyzed on a case-by-case basis to determine necessary mitigation.

Long-term impacts resulting from land use authorizations would predominately affect the visual setting of the Oregon NHT. Construction of facilities such as wind turbines or overhead power transmission lines would contribute to a decrease in the historical visual context of the Oregon NHT. For comparison among alternatives, the degree of change to visual resources that would result from land use authorizations is relative to the proportion of expected wind energy development and existing and expected utility development area.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative would manage all rutted segments of the Oregon NHT as avoidance/restricted areas for overhead, surface, and underground utilities. This action would maintain the physical and visual setting of undisturbed rutted segments of the Oregon NHT.

Existing and potential overhead utility developments have impacts to Oregon NHT settings relative to the area authorized for use. Combined, 28% of the protective zone and 25% of the visual foreground have existing utility facilities or potential for utility development. This is the same for all alternatives.

The Oregon NHT protective zone is excluded from wind energy development, but 48% of the visual foreground has potential for wind energy development. Within the combined trail corridor and visual foreground, 31,000 acres, or 41%, are in the expected wind energy development area. The integrity of the NHT historic setting on these acres would decrease with development. This is similar to Alternative II but more than Alternatives I, III, IV, V, and VI.

Impacts from Management Common to All Action Alternatives

New ROWs would be granted subject to various stipulations and conditions. The placement of new ROWs in the protective zone overlaying areas that have been previously disturbed or are part of an existing ROW would limit any changes to settings by land use authorizations. This would maintain the physical, visual, and acoustic setting of the Oregon NHT.

Impacts from Management Specific to Alternatives I,III, IV, and V

Impacts from utility ROW corridors in Alternatives I and III are identical to the No Action Alternative.

Alternatives I, III, IV, and V exclude the Oregon NHT protective zone from wind energy development; however, approximately 33% of the remaining trail corridor and 36% of the visual foreground area have potential for wind energy development in these alternatives. Within the combined trail corridor and visual foreground, 22,000 acres, or 29%, are in the expected wind energy development area. The integrity of the NHT historic setting on these acres would decrease with development. This is less than the No Action Alternative and Alternative II, and more than Alternative VI.

Impacts from Management Specific to Alternative II

Impacts from utility ROW corridors in Alternative II are identical to the No Action Alternative.

Alternative II excludes the Oregon NHT protective zone/trail corridor from wind energy development. However, 47% of the visual foreground area is expected to be developed for wind energy. Within the combined trail corridor and visual foreground, 30,000 acres, or 40%, are in the expected wind energy development area. The integrity of the NHT historic setting on these acres would decrease with development. Only the No Action Alternative makes more of the NHT historic setting vulnerable to impacts from wind energy development.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Impacts from utility ROW corridors in Alternative VI are identical to the No Action Alternative.

Alternative VI excludes the Oregon NHT protective zone and over 99% of the remaining National Trail Management Corridor from wind energy development. However, 40% of the visual foreground beyond the trail corridor is in the expected wind energy development area. Within the combined trail corridor and visual foreground, 10,000 acres, or 13%, are in the expected wind energy development area. The integrity of the NHT historic setting on these acres would decrease with development. This alternative makes the Oregon NHT least vulnerable to impacts from wind energy development compared to all the other alternatives.

Summary of Direct and Indirect Impacts

Table 4-399 identifies the percent of the Oregon National Historic Trail (NHT) protective zone with management actions that would maintain or improve NHT values.

Table 4-399. Percent of the Oregon National Historic Trail and Visual Foreground with Management Actions to Maintain or Improve National Historic Trail Values by Resource or Resource Use by Alternative

Resource or Resource Use		Alternative						
		No Action	I	II	III	IV	V	VI
Upland Vegetation		0	100	0	0	0	100	100
Noxious Weeds and Invasive Plants		0	100	0	100	100	100	100
Livestock Grazing		12	15	12	12	13	46	12
Visual Resources	Protective Zone	99	86	86	86	86	86	86
	Within 3 Miles of Trail	36	12	12	12	12	12	49
Land Use Authorizations	Wind Development	59	71	60	71	71	71	87
	Utility Development	75	75	75	75	75	75	75

Impacts from the No Action Alternative

The No Action Alternative provides more management that would maintain or improve the integrity of the historical setting of the Oregon NHT than Alternative II, but less than Alternatives I, III, IV, V, and VI. Management in this alternative would be in accordance with current plans and guidelines for the Oregon NHT, but it would not make vegetation and noxious weed treatments within the protective zone a priority. The absence of priority treatments of upland vegetation and noxious weeds and invasive plants would, over time, decrease the quality of the physical and visual setting of the trail. The No Action Alternative would provide more protection for the trail's visual setting by allocating more acres within the Oregon Trail protective zone and visual foreground to Visual Resource Management (VRM) Class I and II than any of the alternatives except Alternative VI. The benefits of this protective allocation are diminished, however, because the No Action Alternative also allocates more of the trail's visual foreground to VRM Class IV than any alternative but Alternative II. Overall, the No Action Alternative would result in moderate adverse impacts to the Oregon NHT.

Impacts from Alternative I

Alternative I provides more management than the No Action Alternative and Alternatives II, III, and IV that would maintain or improve the historical setting of the Oregon NHT, but less than Alternatives V and VI. This alternative would manage the Oregon NHT in accordance with current plans and guidelines, and

prioritizes the protective zone for noxious weeds and invasive plants treatments. Overall, Alternative I would result in moderate beneficial impacts to the Oregon NHT, primarily due to management actions for upland vegetation.

Impacts from Alternative II

Alternative II provides the least management among the alternatives to maintain or improve the historical setting of the Oregon NHT. This alternative would manage the Oregon NHT in accordance with current plans and guidelines, but it would not make vegetation and noxious weed treatments within the protective zone a priority. The absence of priority treatments of upland vegetation and noxious weeds and invasive plants, and designation of the visual foreground as VRM Class IV would increase the potential deterioration of the NHT's physical and visual setting. This alternative has the second highest proportion of foreground area available for wind energy development authorization, which, if developed, would also diminish the visual setting. Overall, Alternative II would result in moderate adverse impacts to the Oregon NHT, primarily due to allocations for VRM.

Impacts from Alternative III

Alternative III provides more management that would maintain or improve the historical setting of the Oregon NHT than the No Action Alternative and Alternative II, but less than Alternatives I, IV, V, and VI. This alternative would manage the Oregon NHT in accordance with current plans and guidelines, and prioritizes the protective zone for noxious weeds and invasive plants treatments; however, this alternative does not prioritize the trail corridor for upland vegetation treatments. Designation of the trail foreground as VRM Class III and IV provides more protection than Alternative II, less than the No Action Alternative and Alternative VI, and the same level as Alternatives I, IV, and V. Overall, Alternative III would result in minor beneficial impacts to the Oregon NHT, primarily due to actions for noxious weeds and invasive plants.

Impacts from Alternative IV

Alternative IV provides more management that would maintain or improve the historical setting of the Oregon NHT than the No Action Alternative and Alternatives II and III, but less than Alternatives I, V, and VI. This alternative is essentially identical to Alternative III, with slightly less protective zone and National Trail Management Corridor acres available for grazing thus avoiding changes to the physical settings of the trail from this use. Overall, Alternative IV would result in minor beneficial impacts to the Oregon NHT, primarily due to actions for noxious weeds and invasive plants.

Impacts from Alternative V

Alternative V provides more management that would maintain or improve the historical setting of the Oregon NHT than all alternatives except Alternative VI. This alternative is essentially identical to Alternative I, with slightly less land available for wind energy development authorizations. This alternative also has the lowest proportion of corridor acres available for grazing, minimizing impacts to trail resources from this use. Overall, Alternative V would result in moderate beneficial impacts to the Oregon NHT, primarily due to management actions for upland vegetation.

Impacts from Alternative VI (Proposed RMP)

Alternative VI provides the most management that would maintain or improve the historical setting of the Oregon NHT. This alternative is similar to Alternatives I and V but with substantially less land within the National Trail Management Corridor available for wind energy development authorizations and substantially more land allocated to VRM Class II. Overall, Alternative VI would result in major beneficial impacts to the Oregon NHT, primarily due to management actions for visual resources, upland vegetation, and land use authorizations.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The analysis area for cumulative impacts to the Oregon National Historic Trail (NHT) is the trail route across the Snake River Plain in southern Idaho. It includes the planning area plus portions of the Burley Field Office, the Snake River Birds of Prey National Conservation Area, and the Four Rivers Field Office.

The physical setting of the Oregon Trail and the nature of past, present, and reasonably foreseeable impacts is very similar across this area.

Historically, the leading cause of impacts to the Oregon Trail was the transfer of public land to private ownership. The transferred lands were usually converted to agricultural fields and long stretches of trail were destroyed. The remaining intact trail was fragmented by this practice. Also, prior to legislation aimed at preserving the trail, several major power transmission lines were erected on or near the trail route. These developments continue to impact the trail's historical and visual setting. With passage of the National Historic Preservation Act in 1966, the National Environmental Policy Act in 1969, and the National Trails System Act in 1978, and the resulting increase in preservation planning, the rate of loss for the Oregon Trail has slowed significantly. In the mid-1980s, Oregon Trail management plans were prepared for each BLM district in southern Idaho. These plans created 0.5 mile wide protective zones around the intact trail segments.

The primary sources of new and reasonably foreseeable future impacts to the Oregon NHT are new and proposed energy-related developments which would alter the visual and historic setting of the trail; wind farms and transmission lines can be seen for miles on the Snake River Plain.

Summary of Cumulative Impacts

Cumulative Impacts from the No Action Alternative and Alternative II

Management for the Oregon National Historic Trail (NHT) under these alternatives would be similar to trail management in the Burley and Four Rivers Field Offices which operate under 1980s era management plans. The National Trail Management Corridor would be the minimum compared to Alternatives I, III, IV, V, and VI. Incremental effects from visual intrusions on the NHT setting would be greatest under these alternatives.

Cumulative Impacts from Alternatives I and V

These alternatives provide more management to mitigate and prevent physical and visual effects to the NHT corridor than the No Action Alternative and Alternatives II, III, and IV. Cumulative effects to the NHT corridor from Alternatives I and V should be reduced in relation to all alternatives except Alternative VI.

Cumulative Impacts from Alternatives III and IV

These alternatives provide more management to mitigate and prevent physical and visual effects to the NHT corridor than the No Action Alternative and Alternative II, but less than Alternatives I, V, and VI. Cumulative effects to the NHT corridor from Alternatives III and IV should be reduced in relation to the No Action Alternative and Alternative II but may increase in relation to the other alternatives.

Cumulative Impacts from Alternative VI (Proposed RMP)

Alternative VI provides more management to mitigate and prevent physical and visual effects to the NHT corridor than all the other alternatives. The wider corridor and more restrictive Visual Resource Management Class assigned to the NHT under this alternative should result in the greatest reduction in cumulative effects to Federally managed trail segments within the analysis area.

4.5.3. Wilderness

The management of the Bruneau-Jarbidge Rivers Wilderness area would be the same under all alternatives. The Salmon Falls Creek Wilderness Study Area and the Bruneau-Jarbidge Rivers Wilderness Area are special designations that were previously established by law and policy, nothing in this document will change these designations. The management of wilderness focuses on maintaining the wilderness characteristics of appearance of naturalness, outstanding opportunities for solitude and/or primitive, unconfined recreation, size and guidelines have already been established for managing this area.

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to wilderness:

- **The quality of naturalness and natural conditions in the wilderness -** Naturalness is affected by surface disturbing activities and associated human uses and developments.
- **The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area -** Opportunities for primitive, unconfined recreation are affected by the availability, or non-availability, of landscapes free of surface disturbing activities and the sights and sounds of human uses and their developments.

Methods and Assumptions

Impacts to wilderness from management in the following sections of Chapter 2 were analyzed in detail: *Soil Resources, Water Resources, Upland Vegetation*, *Wildland Fire Ecology and Management, Cultural Resources, Visual Resources*, *Lands with Wilderness Characteristics*, *Livestock Grazing*, *Recreation, Transportation and Travel,* and *Land Tenure*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for wilderness.

This analysis considers impacts to wilderness characteristics of naturalness, opportunities for solitude, primitive/unconfined recreation, and special features. Impacts are limited to potential changes in wilderness characteristics for the Bruneau-Jarbidge Rivers Wilderness. Wilderness is a special designation that was established in the planning area by law and policy. No decisions or management actions in this RMP would change these designations.

Under all alternatives, the wilderness would be managed consistent with the Management of Designated Wilderness Areas (BLM Manual 6340) and the pending Owyhee Canyonlands Wilderness and Wild and Scenic Rivers Management Plan.

- Development of management, including goals, objectives and actions for ecological and biological, water and soil, cultural, and visual resources would generally benefit the wilderness area by maintaining or improving naturalness. Otherwise, all management of these resources would be compatible with the pending Owyhee Canyonlands Wilderness and Wild and Scenic River Management Plan under all the alternatives.
- Uses and activities occurring outside wilderness areas could influence the wilderness area, though such influences would generally be indirect.
- All guidelines for the maintenance of the wilderness area's characteristics as identified in this document would be followed.

Direct and Indirect Impacts

Impacts from Soil Resources Actions

The following indicator was used to analyze the impacts of Soil Resources actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Generally, development of goals, objectives and actions for soils would moderately benefit special designations by maintaining or improving natural and ecological conditions. Thus, management of these resources would be compatible with the Bruneau-Jarbidge Rivers Wilderness area. Maintaining and improving soil cover and productivity would promote to a minor degree retention of natural conditions and plants by preventing erosion of soils. Scenic resources would be retained to the extent that native plant communities are protected from direct mortality or indirectly harmed by establishment of invasive plants within the greater plant community. Associated watershed and soil actions would also promote retention

of natural conditions due to decreased erosion, maintenance of plant cover, a decrease in invasive plants, and localized gain in plant and ecological community diversity.

Impacts from Water Resources Actions

The following indicator was used to analyze the impacts of Water Resources actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Development of goals, objectives and actions for water would generally benefit the Bruneau-Jarbidge Rivers Wilderness by maintaining or improving the quality of naturalness in the area. Associated water resource actions would also promote retention or improvement of natural conditions due to meeting water quality standards and maintaining riparian conditions. As a consequence, management of these resources would be compatible with the wilderness area under all the alternatives.

Impacts from Upland Vegetation Actions

The following indicators were used to analyze the impacts of Upland Vegetation actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Restoration of surface disturbances would be emphasized, use of native species in all restoration projects would be required, and an integrated weed management program to control invasive plants would be compatible with the Owyhee Canyonlands Wilderness and Wild and Scenic River Management Plan. The use of native species and control of invasive plants would limit the spread of non-native vegetation and reduce the size and intensity of wildland fires.

Impacts from Wildland Fire Ecology and Management Actions

The following indicators were used to analyze the impacts of Wildland Fire Ecology and Management actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Recognized resource values would be potentially diminished, degraded or lost all together over the long term by certain actions and outcomes associated with wildland fire management. Such impacts, however, do not vary substantially by alternative. Fires remove the vegetation, which impacts the scenery, naturalness and ecosystem integrity of an area. Associated soil erosion may damage or destroy surface resources, harm artifacts, or alter natural appearing historical or scenic landscapes. Fire suppression activities impact wilderness areas due to the evidence of heavy equipment and vehicles used to cut fire lines and associated travel. Fire line scars can last for decades, even with reclamation. Additionally, fire suppression activities would result in diminished naturalness and opportunities for solitude over the short term in localized areas. Fires kill and remove native vegetation, allowing disturbed landscapes to be easily invaded by opportunistic non-native invasive plants like cheat grass.

In summary, all the actions described can degrade or diminish naturalness, vegetation, habitat, scenery, ecological integrity and cultural resources over the long term and are considered major both in scope, scale and severity. On the other hand, effective fire suppression quickly employed by ground and air based firefighting organizations can suppress fires in special designation areas, limiting potential disturbances. Quick suppression actions would minimize or eliminate the potential adverse and major long-term effects of fire, including consequences on naturalness, scenery and ecosystems associated

with large scale mechanized fire suppression and the severe long-term potential for minor to major non-native ecosystem conversion. Overall impacts would range from minor to major.

Impacts from Cultural Resources Actions

The following indicators were used to analyze the impacts of Cultural Resources actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Management of cultural resources in wilderness areas would continue on a case-by-case basis as directed by policy. Future site development for public interpretive and educational purposes, excavation for scientific study, or other similar activities would have none to negligible short- and long-term effects on the naturalness and opportunities for solitude or primitive, unconfined recreation of designated wilderness; however, these effects are not measurable in the absence of such allocations.

Impacts from Visual Resources Actions

The following indicators were used to analyze the impacts of Visual Resources actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Wilderness areas themselves are classified as Visual Resource Management (VRM) Class I, with the objective of preserving the existing character of the landscape. While this would not preclude many forms of management activity, the level of change to the characteristic landscape should remain low and must not attract attention. Impacts on naturalness and opportunities for solitude would thus be negligible to minor. Under all alternatives, except Alternative V, public lands adjacent to the east of the Bruneau-Jarbidge Rivers Wilderness Area would retain the existing VRM Class IV. This VRM class allocation would allow for landscape altering activities that would be visible from the adjacent wilderness area, resulting in potentially minor to moderate long-term visual detractions from naturalness and opportunities for solitude.

Impacts from Lands with Wilderness Characteristics Actions

The following indicators were used to analyze the impacts of Lands with Wilderness Characteristics actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

No areas would be allocated as lands managed to protect wilderness characteristics under the No Action Alternative and Alternatives II, III, and VI. Nine areas with wilderness characteristics are adjacent to the Bruneau-Jarbidge Rivers Wilderness. Not allocating these areas as lands managed to protect wilderness characteristics would result in minor harm to naturalness and opportunities for solitude and primitive, unconfined recreation within the wilderness area.

In Alternative I, four areas (30,000 acres) adjacent to the wilderness would be allocated as lands to protect wilderness characteristics. This would result in restrictions to certain types of land use and development activities, which would indirectly contribute to the resource values of the adjacent wilderness area. Opportunities for solitude would be enhanced, areas open to hiking and hunting in a wild setting would be increased, and natural conditions would be retained over a larger area.

In Alternative V, 10 areas (45,500 acres) adjacent to the wilderness would be allocated as lands to protect wilderness characteristics. This would result in restrictions to certain types of land use and development activities, which would indirectly contribute to the resource values of the adjacent wilderness area. Opportunities for solitude would be enhanced, areas open to hiking and hunting in a wild setting would be increased, and natural conditions would be retained over a larger area. Major indirect positive impacts are expected.

Impacts from Livestock Grazing Actions

The following indicators were used to analyze the impacts of Livestock Grazing actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All alternatives would leave existing livestock grazing regimes in place, and would have minor and localized impacts on naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. Taken as a whole however, current-grazing regimes would not detract from nor greatly alter current wilderness conditions in the Bruneau-Jarbidge Rivers Wilderness over the life of the plan.

Localized impacts would occur with potential minor effects, including livestock use adjustments with increased or fewer animals; changes to grazing management systems; potentially large ephemeral turnouts causing short-term impacts on naturalness and loss of solitude and primitive recreation opportunities; and construction or abandonment of rangeland developments. Such actions would degrade or enhance naturalness and opportunities for solitude and primitive, unconfined recreation, depending on the action and would be addressed on a case-by-case basis in compliance with National Environmental Policy Act. Impacts from grazing are further detailed in the Owyhee Canyonlands Wilderness and Wild and Scenic River Management Plan.

Impacts from Recreation Actions

The following indicators were used to analyze the impacts of Recreation actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Future recreation standards and management prescriptions established for visitation, facility development, and other recreation-related considerations would be instructed to protect wilderness values. Long-term loss, impairment or diminishment of wilderness values due to recreation management would be negligible and impact only localized areas. Special Recreation Permits would continue to be authorized; however wilderness management prescriptions mandated by the pending Owyhee Canyonlands Wilderness and Wild and Scenic River Management Plan would be satisfied. Accordingly, no impacts were identified and therefore, impacts would be negligible.

Impacts from Transportation and Travel Actions

The following indicators were used to analyze the impacts of Transportation and Travel actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Contributions to naturalness and opportunities for solitude and primitive recreation would be augmented under all alternatives because boundary roads, cherry stems, and primitive roads adjacent to wilderness areas would eventually be managed as part of a designated transportation and travel management network. Potentially moderate, but adverse effects, from motorized intrusions and associated recreation uses would be reduced in some areas.

Impacts from Land Tenure Actions

The following indicators were used to analyze the impacts of Land Tenure actions on wilderness:

- The quality of naturalness and natural conditions in the wilderness and
- The quality of opportunities for solitude and primitive, unconfined recreation within the wilderness area.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

Acquiring non-Federal lands within wilderness areas would increase the potential for protecting naturalness, opportunities for solitude, and opportunities for primitive unconfined recreation in those areas. Impacts would be minor to major. Impacts from Land Tenure management are further detailed in the Owyhee Canyonlands Wilderness and Wild and Scenic River Management Plan.

Cumulative Impacts

Past, present, and Reasonably Foreseeable Actions

Impacts from Management Common to the No Action Alternative and All Action Alternatives

In the next 20 years, the designated wilderness area would be primarily affected by the number and proximity of adjacent motorized travel routes, the volume and type of traffic on those corridors, the intensity of military over flights, large wildland fires, and the quantity and type of recreational users.

Summary of Cumulative Impacts

Impacts from Management Common to the No Action Alternative and All Action Alternatives

The Bruneau-Jarbidge Rivers Wilderness may experience a low visitor use increase and anticipate moderately increased amounts of motorized recreation use along the boundary. Wilderness values, on the whole, would remain as they are today as the area is rugged and remote, lack any visitor amenities, and have few non-motorized/non-mechanized trails.

4.5.4 Wild and Scenic Rivers

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to Wild and Scenic Rivers (WSRs):

- **Outstandingly Remarkable Values (ORVs) –**Eligible, suitable, or designated wild and scenic rivers, or sections of those rivers, that are free-flowing and possess at least one "outstandingly remarkable" value, such as scenic, recreational, geologic, fish, wildlife, historic, cultural, or other features.
- **Tentative classification -** Rivers are classified as wild, scenic, or recreational.
  - Wild River Areas – Rivers or sections of rivers free of impoundments, generally inaccessible except by trail.
  - Scenic River Areas – Rivers or sections of rivers free of impoundments, accessible in places by roads
  - Recreational River Areas – Rivers or sections of rivers that are readily accessible by roads and may have some development along their shorelines.

These indicators were selected because they represent the values required for a river segment's eligibility for inclusion into the National Wild and Scenic Rivers System (NWSRS) and the focus of protective management of eligible and suitable segments.

Methods and Assumptions

The Omnibus Public Lands Management Act of 2009 designated four Wild and Scenic Rivers (WSRs) within the planning area for inclusion into the NWSRS; Bruneau River (two segments), West Fork of the Bruneau River, and Jarbidge River.

Additional management direction for the four designated WSRs will be provided by the pending Owyhee Canyonlands Wilderness and Wild and Scenic River Management Plan; ORVs identified along the segments are protected.

Impacts to WSRs from management in the following sections of Chapter 2 were analyzed in detail: *Wild and Scenic Rivers*, *Visual Resources*, *Minerals*, and *Areas of Critical Environmental Concern*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicator for WSRs. Impacts from management for WSRs can be found under *Impacts from Wild and Scenic Rivers Actions* in the *Geologic Features, Water Resources,* and *Wilderness Study Area* sections.

This analysis of management and subsequent impacts for WSRs is limited to eligible and suitable river segments within or bordering the planning area; these segments will be referred to as "study rivers" throughout this analysis. Only Congress or the Secretary of the Interior can designate a river as wild, scenic, or recreational for inclusion in the NWSRS; therefore, the determination and timing of the river designation are outside of BLM's control.

If Congress releases suitable study rivers from consideration for designation, qualifying ORVs and the associated tentative classification would be subject to management for adjacent lands, which could include actions that decrease or diminish these attributes, as these rivers would no longer be managed to maintain or enhance those values.

Each study river has ORVs that qualify that segment for eligibility as well as a tentative classification as wild, scenic, or recreational. A study river's ORVs are present in the river itself or within 0.25 miles of the ordinary high water mark on both sides of the river. Whether management decisions or actions that would affect individual resources or resource uses impact a study river depends on that segment's qualifying ORVs and tentative classification. These qualifying values are to be maintained or enhanced as set forth by Section 10(a) of the Wild and Scenic Rivers Act of 1968. A list of the WSR segments in the planning area and their ORVs and tentative classifications can be found in the *Wild and Scenic Rivers* section of Chapter 3.

A stream segment must first have free-flowing conditions to qualify as a study river. There are no current proposals for dams or diversions on any current free-flowing waterway within the planning area. However, if Idaho were to issue new water rights or transfer rights to a waterway within the planning area, this would potentially impact the free-flowing condition of affected WSR segments. For a dam or diversion to be sited and built on BLM-managed lands, a right-of-way would need to be secured for the development. Without specific proposals, impacts of this type of activity cannot be defined nor quantified and, as a result, will not be analyzed in detail. Any Federally approved water resource projects within a study river may be built only to the degree that they would be if the river were a designated WSR river.

Direct and Indirect Impacts

Impacts from Wild and Scenic Rivers Actions

The following indicators were used to analyze the impacts of Wild and Scenic Rivers actions on Wild and Scenic Rivers:

- Outstandingly Remarkable Values (ORVs) and
- Tentative classification.

Impacts from Management Specific to the No Action Alternative

All 23 miles of the suitable Bruneau Canyon rim-to-rim would be recommended for mineral entry withdrawal and would be managed as a utility avoidance area. This would afford protection from impacts associated with these types of developments, such as changes in landforms, additional transportation routes, or installation of electric transmission lines.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

All 23 miles of the Bruneau River occurring along or within the boundaries of the planning area that have been found to be suitable would continue to be recommended for inclusion in the National Wild and Scenic Rivers System (NWSRS); all 110 miles of eligible river segments would continue to be eligible for inclusion in the NWSRS. As a result, the ORVs and tentative classification of these segments would be maintained or improved by continuing protective management on these suitable and eligible river segments. Management to maintain or enhance suitable and eligible segment ORVs, water quality, and tentative classification and to conduct suitability studies on eligible segments would maintain or improve study river values.

Impacts from Management Specific to Alternatives I, III, IV, V, and VI (Proposed RMP)

Closing all suitable and eligible study river corridors to salable and leasable mineral development would have no impacts to qualifying ORVs or tentative classification.

Impacts from Management Specific to Alternative II

Allowing salable mineral development within a study river corridor would directly impact water quality and indirectly impact populations of BLM Sensitive species and their habitats that qualify several of the study rivers in the planning area for inclusion in the NWSRS. Other impacts relative to salable mineral development include removal or alteration of geologic features, alterations to scenic elements, and disruption of cultural resources.

Leasable mineral development with no surface occupancy restrictions is not likely to impact the qualifying ORVs or tentative classification of study rivers.

Impacts from Visual Resources Actions

The following indicator was used to analyze the impacts of Visual Resources actions on Wild and Scenic Rivers:

- Outstandingly Remarkable Values (ORVs).

Variations in Visual Resource Management (VRM) Classes (BLM Handbook 8410-1) relative to the location of study rivers would allow for impacts to scenic quality and potential loss of a qualifying ORV. Study rivers with a scenic ORV would become ineligible if visual resources are altered. Visual resources are protected from alteration through VRM Class designations I or II and would maintain the regionally unique scenic quality. VRM Class III and IV would allow decreases to the scenic quality. Table 4-400 identifies the study rivers with scenery as a qualifying ORV.

Table 4-400. Study Rivers with Scenery as a Qualifying Outstandingly Remarkable Value

Study Rivers with Outstandingly Remarkable Scenic Value	Miles	Corridor Acres	Percent VRM Class I or II
Cougar Point Creek	1	250	100%
Salmon Falls Creek (lower)	30	5,000	96%
West Fork Bruneau River	23	2,000	100%
West Fork Jarbidge River	10	3,000	100%
Total	**60**	**10,000**	**99%**

Impacts from Management Specific to the No Action Alternative

The No Action Alternative does not identify a VRM Class specifically for study rivers with a scenic ORV; however, 99% of study river corridors would be managed as VRM Class I or II, which would help retain the existing visual character. Alterations to the visual landscape that would impact the scenic ORV would be allowed on 1% of these study rivers.

Impacts from Management Common to All Action Alternatives

The action alternatives would manage study rivers with a scenic ORV as VRM Class I. This would maintain the visual quality in 99% of these study river corridors. The remaining 1% would experience alterations to the visual landscape that would impact the scenic ORV.

Impacts from Minerals Actions

The following indicators were used to analyze the impacts of Minerals actions on Wild and Scenic Rivers:

- Outstandingly Remarkable Values (ORVs) and
- Tentative classification.

Impacts associated with exploration for and extraction of mineral resources could eliminate or alter values within a study river corridor to a degree that would otherwise disqualify it as eligible or change attributes of the tentative classification. For leasable mineral development, Wild and Scenic Rivers (WSRs) corridors are open with no surface occupancy restrictions or closed in every alternative, resulting in no impacts to ORVs or tentative classification of WSRs. Table 4-401 identifies impacts to study rivers from salable and locatable minerals actions.

Table 4-401. Impacts to Study River Corridors from Salable and Locatable Mineral Actions by Alternative (Acres)

Mineral Allocations	Alternative						
	No Action	I	II	III	IV	V	VI
Salable							
Closed	18,000[A]	18,000	5,000	18,000	18,000	18,000	18,000
Open	0	0	13,000	0	0	0	0
Locatable							
Recommended for Withdrawal	10,000	18,000	18,000	18,000	18,000	18,000	0
Not Recommended	8,000	0	0	0	0	0	18,000

[A] Salable mineral sites located within WSR corridors are not anticipated to impact qualifying ORVs or tentative classification because of existence prior to the eligibility study. These sites were never spatially defined in the 1987 Jarbidge RMP.

Impacts from Management Specific to the No Action Alternative

Establishment of new salable mineral sites would not occur in study river corridors in the No Action Alternative. This would maintain the ORVs and tentative classifications.

In the No Action Alternative, 56% (10,000 acres) of the study rivers would be recommended for locatable mineral withdrawal. This would maintain the ORVs and tentative classifications. The remaining 44% would be open to mineral entry, resulting in opportunities for alterations or decreases to qualifying ORVs and tentative classifications. However, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Impacts from Management Specific to Alternatives I, III, IV, and V

In Alternatives I, III, IV, and V, study river corridors would be closed to leasable and salable mineral development and would be recommended for withdrawal from locatable mineral entry; these actions would all result in maintaining the ORVs and tentative classifications of these rivers.

Impacts from Management Specific to Alternative II

In Alternative II, impacts from leasable and locatable mineral management would be identical to those described for Alternatives I, III, IV, and V. However, in Alternative II, only 28% of the study river corridors

would be closed to salable mineral development (5,000 acres), which would maintain the ORVs and tentative classifications in fewer of the study river corridors. The remaining 72% would be available for salable mineral development, resulting in potential alterations and decreases in qualifying ORVs. The acreage on which salable mineral development occurs is expected to increase from approximately 1,300 acres to approximately 2,300 acres over the life of the plan. This is approximately 0.2% of the area available for salable mineral development.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, impacts from leasable and locatable mineral management would be similar to those described for Alternatives I, III, IV, and V. However, 100% (18,000 acres) of the study rivers would not be recommended for locatable mineral withdrawal, resulting in opportunities for alterations or decreases to qualifying ORVs and tentative classifications. As stated in the No Action Alternative, demand for locatable minerals in the planning area is not expected to change from present levels; thus, the potential for impacts to occur over the life of the plan is low.

Impacts from Areas of Critical Environmental Concern Actions

The following indicators were used to analyze the impacts of Areas of Critical Environmental Concern (ACECs) actions on Wild and Scenic Rivers (WSRs):

- Outstandingly Remarkable Values (ORVs) and
- Tentative classification.

Management of relevant and important values within ACECs would generally be complementary to management for study river values. Where ACEC and WSR management occur simultaneously, ORVs and classification would be less likely to change than when the segment is managed only as a WSR.

The relevant and important values for an ACEC are often identical to ORVs identified for an eligible or suitable river that occurs in the same area. For example, scenic values meet relevance and importance criteria in the Bruneau-Jarbidge ACEC and have been identified as an ORV for the Bruneau River. In such cases, overlapping ACEC management for that relevant and important value would also directly maintain or enhance that ORV. Management for other overlapping ACECs may also indirectly maintain or enhance a study river's ORVs, even if the ORV is not also a relevant and important value. Table 4-402 displays acres of study rivers with overlapping ACEC designations.

Table 4-402. Study River Corridors with Overlapping Area of Critical Environmental Concern Designations (Acres)

Study Rivers	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Cougar Point Creek	300	300	0	0	300		300	0
Dave Creek	400	400	0	0	700		800	0
East Fork Jarbidge	2,000	2,000	0	0	2,000		2,000	0
Rocky Canyon Creek	0	0	0	0	500	0	500	0
Salmon Falls Creek (upper)	0	0	0	0	1,000		1,000	0
Salmon Falls Creek (lower)	3,000	3,000	0	3,000	0		5,000	3,000
Snake River, Hagerman Reach	0	600	0	0	0		600	0
Snake River, King Hill Reach	0	600	0	0	0		600	0
Snake River, Three Island Reach	200	300	0	300	300		300	0
West Fork Bruneau River	2,000	2,000	0	0	2,000		2,000	2,000
West Fork Jarbidge River	900	900	0	100	3,000		3,000	0
Sand Point	200	300	0	300	300		300	300
Total	**9,000**	**10,400**	**0**	**3,700**	**910,100**	**9,600**	**16,400**	**5,300**

Impacts from Management Specific to the No Action Alternative

By continuing existing management, 47% of study river corridors would have complementary ACEC management. Management to maintain or enhance relevant and important values within these ACECs would maintain or enhance study river ORVs and tentative classification.

Impacts from Management Specific to Alternative I

In Alternative I, 54% of study river corridors would have complementary ACEC management. Management of public lands to maintain or enhance relevant and important values within these ACECs would maintain or enhance study river ORVs and tentative classification.

Impacts from Management Specific to Alternative II

There would be no ACECs designated in Alternative II. Subsequently, study river corridors in this alternative would not have additional direct or indirect management to maintain or enhance ORVs or tentative classification.

Impacts from Management Specific to Alternative III

In Alternative III, 19% of study river corridors would have complementary ACEC management. Management of public lands to maintain or enhance relevant and important values within these ACECs would maintain or improve study river ORVs and tentative classification.

Impacts from Management Specific to Alternative IV

Complimentary ACEC management would exist on 52% of study river corridors in Alternative IV-A and 50% of study river corridors in Alternative IV-B. Management of public lands to maintain or enhance relevant and important values within these ACECs would maintain or improve study river ORVs and tentative classification.

Impacts from Management Specific to Alternative V

In Alternative V, 85% of study river corridors would also have complementary ACEC management. Management of public lands to maintain or enhance relevant and important values within these ACECs would maintain or improve study river ORVs and tentative classification.

Impacts from Management Specific to Alternative VI (Proposed RMP)

In Alternative VI, 27% of study river corridors would have complementary ACEC management. Management of public lands to maintain or enhance relevant and important values within these ACECs would maintain or improve study river ORVs and tentative classification.

Summary of Direct and Indirect Impacts

Overall management to maintain or enhance the Outstandingly Remarkable Values (ORVs) and tentative classification of study rivers would mitigate the impacts from resource use actions.

Impacts from the No Action Alternative

The No Action Alternative ranks sixth for management that would maintain the existing ORVs and tentative classification. Decreases to these values would be due to the potential for leasable and locatable mineral development in study river corridors.

Impacts from Alternative I

Alternative I ranks second for management that would maintain the existing ORVs and tentative classification. Impacts from management in this alternative are essentially identical to Alternatives III, IV, and V, with only a variation in complementary ACEC management.

Impacts from Alternative II

Alternative II ranks seventh for management that would maintain the existing ORVs and tentative classification. The most notable decreases to these values would be due to study river lands being available for salable mineral development and no complementary management from overlapping ACECs.

Impacts from Alternative III

Alternative III ranks fourth for management that would maintain the existing ORVs and tentative classification. Impacts from management in this alternative are essentially identical to Alternatives I, IV, and V, with only a variation in complementary ACEC management.

Impacts from Alternative IV

Alternative IV ranks third for management that would maintain the existing ORVs and tentative classification. Impacts from management in this alternative are essentially identical to Alternatives I, III, and V, with only a variation in complementary ACEC management.

Impacts from Alternative V

Alternative V ranks first for management that maintains the existing ORVs and tentative classification. Impacts from management in this alternative are essentially identical to Alternatives I and VI, with only a variation in complementary ACEC management.

Impacts from Alternative VI (Proposed RMP)

Alternative VI ranks fifth for management that would maintain the existing ORVs and tentative classification. Impacts from management in this alternative are essentially identical to Alternatives III, IV, and V, with only a variation in complementary ACEC management.

Cumulative Impacts

The cumulative impact analysis area for Wild and Scenic Rivers (WSRs) includes all BLM and Forest Service lands, within the planning area and surrounding BLM Field Offices (Bruneau, Burley, Four Rivers, and Shoshone) and the Humboldt-Toiyabe National Forest (Jarbidge Ranger District). Under all alternatives, where stream segments were found eligible or suitable, management would be consistent with neighboring field and ranger district offices, which also found that portions of these streams are eligible and suitable for inclusion in the National Wild and Scenic Rivers System (NWSRS).

There are no reasonably foreseeable future projects at this time that would impact the segments. However, if major projects are proposed and there is no systematic analysis of impacts on river-related values pursuant to the Wild and Scenic Rivers Act, there would be significant cumulative impacts on river-related values.

Other Federal agencies considering permit applications (not under BLM authority) that affect the free-flowing nature, Outstandingly Remarkable Values, or tentative classification of any of the eligible or suitable segments would need to seek formal comments from the BLM and the BLM would discourage projects with such impacts. Other agencies would not be required to act on the BLM's comments, so the effect to eligible and suitable segments would depend on the decisions outside of BLM authority.

WSR management for the No Action Alternative and all action alternatives continues protective management for the study rivers previously deemed eligible or suitable. When analyzed cumulatively with any past, present, or reasonably foreseeable actions, this management would result in no cumulative impacts that would alter any of the study rivers in the NWSRS. In fact, management of these study rivers in all alternatives would enhance the regional WSR resources by providing management to minimize impacts to these resource values.

4.5.5. Wilderness Study Area

The only Wilderness Study Area (WSA) in the planning area is Lower Salmon Falls Creek WSA (1,700 acres). This WSA extends onto the BLM's Burley Field Office (1,600 acres). The analysis for direct and indirect impacts only addresses the portion of the WSA that is located within the planning area.

Analysis Methods

Indicators

The following indicators were used for the analysis of direct and indirect impacts to the Wilderness Study Area (WSA):

- **Naturalness –** generally appears to have been affected primarily by the forces of nature.
- **Opportunities for solitude –** opportunities for people to experience remote, isolated, and/or secluded places**.**
- **Opportunities for primitive, unconfined recreation –** opportunities for freedom, risk, and the physical and emotional challenges of self-reliance.

These indicators are the individual wilderness characteristics that were specified for inventory in the Wilderness Act of 1977 and are also referred to collectively as wilderness characteristics as a whole in this analysis.

Methods and Assumptions

Impacts to the Wilderness Study Area (WSA) from management in the following sections of Chapter 2 were analyzed in detail: *Wilderness Study Area* and *Special Designations (Areas of Critical Environmental Concern, Wild and Scenic Rivers)*. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for the WSA. Impacts from management for the WSA can be found under *Impacts from Special Designation Actions* in the *Geologic Features* section.

The WSA is a special designation that was previously established in the planning area by law or policy. No decisions or management actions in this RMP would change these designations. Under all alternatives, the WSA would continue to be managed consistent with the Management of Wilderness Study Areas (BLM Manual 6330) until such time as Congress either designates all or portions of the WSA as wilderness or releases the WSA, or portions of the WSA, from further consideration for wilderness designation.

Lands released from WSA management would be subject to management as directed by Congress or as determined by the existing land use plan. This analysis assumes that released lands would be managed under the direction contained in Chapter 2 of this document; the impacts to the existing wilderness characteristics are analyzed accordingly.

The analysis is based on the following assumption:

- Management actions that enhance biological or environmental characteristics of the area would improve the wilderness quality and suitability of the WSA.

Direct and Indirect Impacts

Impacts from Wilderness Study Area Actions

The following indicators were used to analyze the impacts of Wilderness Study Area (WSA) actions on the Wilderness Study Area:

- Naturalness,
- Opportunities for solitude, and
- Opportunities for primitive, unconfined recreation.

WSAs are managed according to policy set forth in BLM Manual 6330. WSAs would continue to be managed in a way to avoid impairment of the existing wilderness characteristics.

Impacts from Management Common to the No Action Alternative and All Action Alternatives

WSAs will be managed to the non-impairment standard, and the BLM would not allow activities to occur within WSAs that would impair their suitability for preservation as wilderness. Therefore, an impact on WSAs (i.e., impairment) would not occur under any of the alternatives. Although impacts on natural resources within WSAs would occur from a variety of uses, they would be non-impairing and therefore would not affect the wilderness characteristics of the WSAs. Some uses that would not take place in a designated WSA might be permitted under BLM Manual 6330 because they are only temporary uses that do not create surface disturbance or involve permanent placement of structures. The naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation would not be impaired.

Impacts from Special Designation Actions

The following indicators were used to analyze the impacts of Special Designation actions on the Wilderness Study Area (WSA):

- Naturalness,
- Opportunities for solitude, and
- Opportunities for primitive, unconfined recreation.

Although management for Areas of Critical Environmental Concern (ACECs) and Wild and Scenic Rivers (WSRs) are not intended to protect wilderness characteristics, the prescribed management may indirectly maintain wilderness characteristics in released areas. All the alternatives would continue to manage released WSA lands within the WSR boundary according to the management prescribed for this designation. The impacts to naturalness and opportunities for solitude and primitive, unconfined recreation would be dependent upon the prescribed management for this individual designation. In general, this designation would be protective to some, if not all, of the wilderness characteristics within the affected boundary.

Impacts from Management Specific to the No Action Alternative and Alternatives I, III, and VI (Proposed RMP)

The No Action Alternative and Alternatives I, III, and VI would designate the Salmon Falls Creek ACEC which entirely overlaps the WSA. The eligible Salmon Falls Creek WSR overlaps 1,650 acres of the WSA. This provides an additional layer of indirect protection if Congress released the WSA on 97% of the WSA Lands. The naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation would not be impaired under these alternatives.

Impacts from Management Specific to Alternative II and IV

The Salmon Falls Creek ACEC would not be designated in Alternatives II and IV. The eligible WSR would remain and would provide a measure of indirect protection for 97% of the WSA lands. If protective legislation was not prescribed and the released lands lacked other designated management the naturalness and opportunities for solitude and primitive recreation would likely decrease depending on the resource uses and developments proposed. Under Alternatives II and IV this would be 3% of the WSA lands.

Impacts from Management Specific to Alternative V

Alternative V would designate the Sagebrush Sea ACEC which would provide indirect protection to 100% of the WSA if it was released by Congress. The eligible WSR would remain and would provide a measure of protection for 97% of the WSA lands. Alternative V would provide the same level of overlap protection as the No Action Alternative and Alternatives I, III, and VI. The naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation would not be impaired under Alternative V.

Summary of Direct and Indirect Impacts

Overall, if the Wilderness Study Area (WSA) was released, the No Action Alternative and Alternatives I, III, V, and VI would result in no impacts to wilderness characteristics on lands within the WSA, followed by Alternatives II and IV. Alternatives II and IV would have the lowest level of indirect management for wilderness values and thus would allow the greatest opportunity for impact.

Impacts from the No Action Alternative

If WSA lands were to be released other management strategies would apply where ACECs and Wild and Scenic Rivers (WSRs) are designated. This additional management would provide indirect protection of wilderness characteristics on 100% of the existing WSA lands.

Management under the No Action Alternative would result in no impacts to wilderness characteristics on lands released from WSA management.

Impacts from Alternatives I, III, V, and VI (Proposed RMP)

Because the WSA would continue to be managed under BLM Manual 6330, wilderness characteristics in the WSA would continue to be maintained or enhanced.

Alternatives I, III, V, and VI would manage released lands in accordance with associated legislation or direction for adjacent non-wilderness lands. Potential decreases in wilderness characteristics would be possible if protective management is not otherwise specified by Congress for these released lands. However, other management associated with overlying designations such as the ACEC, and the WSR corridor, would provide indirect management for wilderness characteristics on 100% of the existing WSA lands.

Management under Alternative I would result in no impacts to wilderness characteristics on lands released from WSA management.

Impacts from Alternatives II and IV

The impacts to wilderness characteristics within the WSA from Alternatives II and IV would be similar to Alternative I. However, additional management as the WSR corridor would provide indirect management for wilderness characteristics on 97% of the existing WSA lands. Management under Alternatives II and IV would have minor adverse impacts to wilderness characteristics on lands released from WSA management.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis considers impacts to the entire Lower Salmon Falls Creek Wilderness Study Area (WSA) (3,300 acres) since it spans both the Jarbidge and Burley Field Offices and is managed jointly.
Past, present, and reasonably foreseeable actions for the following resource cumulatively affects wilderness characteristics:

- Wilderness Characteristics.

If WSA lands are released from wilderness study, Congress has the authority to prescribe management that applies to the released lands. This management would further protect or enhance these lands, or remove protective management altogether; however, the extent or existence of these management prescriptions cannot be anticipated. For the purpose of the cumulative impact analysis, the following assumptions were made:

- Congress would act upon the WSA as a whole.
- Release language from Congress would remove the WSA from management under BLM Manual 6330 and return this land into multiple-use management according to the existing land use plan (Section 202 of Federal Land Policy and Management Act of 1976).
- Portions of the WSA within the Burley Field Office (1,600 acres) would continue to have indirect management for wilderness characteristics as part of the Salmon Falls Creek ACEC.

Summary of Cumulative Impacts

The Lower Salmon Falls Creek Wilderness Study Area (WSA) would be managed for wilderness characteristics until Congress acts on the WSA. The cumulative impacts to wilderness characteristics

relative to the portion of this WSA that is located within the Burley Field Office vary across the alternatives mostly due to the varying management of overlapping special designations if Congress was to release the WSA lands.

Cumulative Impacts from the No Action Alternative and Alternatives I, III, V, and VI (Proposed RMP)

The Lower Salmon Falls Creek WSA will continue to be managed in accordance with BLM Manual 6330 for lands under wilderness review.

If WSA lands are released from study status and returned to management as specified by the current land use plans, portions of these lands would be subject to management as prescribed by other existing designations such as ACECs and Wild and Scenic Rivers (WSRs). Management specific to these designations is expected to indirectly maintain or enhance some or all of the wilderness characteristics. In the No Action Alternative and Alternatives I, III, V, and VI these intersecting designations would result in indirect management for wilderness characteristics on 100% of lands with these characteristics within the Lower Salmon Falls Creek WSA within the Jarbidge and Burley Field Offices.

Cumulative Impacts from Alternative II and IV

Alternative II and IV would continue to manage WSAs according to BLM Manual 6330.

If WSA lands are released from study status and returned to management as specified by the current land use plans there would be no overlapping ACEC designation on the Jarbidge Field Office side. The ACEC designation would remain on the Burley Field Office managed side. The overlapping eligible WSR designation would result in indirect management for wilderness characteristics on approximately 99% of released WSA lands with these characteristics within the Jarbidge and Burley Field Offices managed lands in Salmon Falls Creek Canyon.

4.6. SOCIAL AND ECONOMIC FEATURES

4.6.1. Social Conditions

Analysis Methods

Indicator

The following indicator was used for the analysis of impacts to social conditions:

- **Quality of life –** Quality of life is a subjective assessment of the general well-being of individuals and societies. In general, quality of life includes economic measures such as wealth and employment in addition to the built environment, physical and mental health, education, recreation and leisure time, and social belonging (Gregory et al., 2009). Because data is not available on an individual level, the analysis will focus on community quality of life. A community's quality of life "is constructed of the shared characteristics residents experience in places… and the subjective evaluations residents make of those conditions" (Myers, 1987). For this analysis, communities are described in terms of stakeholder groups. These groups are perceived to have similar experiences and values that will lead them to react similarly to land management decisions.

Methods and Assumptions

Impacts to social conditions from management in the following sections of Chapter 2 were analyzed in detail: *Livestock Grazing*, *Recreation*, *Transportation and Travel*, and *Land Use Authorizations*. Management from the remaining sections was excluded from detailed analysis because either the management did not affect stakeholder quality of life or the relationship between the management and quality of life could not be reliably characterized.

Because it is impossible to describe changes in quality of life for every individual invested in the planning area, individuals were grouped into several key stakeholder groups described below. Individuals within stakeholder groups were assumed to experience the same change in quality of life based on actions in the sections identified above.

Other stakeholder groups not directly connected to the BLM would be affected in the same proportion that their individual values or group missions and charters coincide or depart from the various objectives described in Chapter 2. Impacts to the quality of life of these other stakeholders are not analyzed in further detail in this section. To the extent these individuals or groups are physically associated with the planning area their use is reflected in those stakeholder groups most closely reflecting their use of the planning area.

Ranchers

Ranchers are assumed to derive quality of life from their ability to earn a living through ranching (economic measures) and its associated way of life (physical and mental health, recreation and leisure time, and social belonging). Scoping comments submitted by ranchers revealed they use the planning area for scientific, educational, spiritual, aesthetic, and recreational purposes. The identities and ways of life of ranchers in the planning area are deeply connected with these lands, and they take great pride in the care that they and their ancestors have devoted to these lands (Evans, 2008).

Local (Non-Ranching) Residents

In 2001, 40% of Idaho residents reported they were highly satisfied with their quality of life (Gonzales, 2002). "Residents frequently perceive a shared interest in the fate of their community, because the attributes forming the local quality of life constitute a collective good contributing to the quality of their lives" (Myers, 1987). The quality of life for local residents can be tied to the economic viability of their community. In particular, measures associated with jobs have been weighted highly by local residents (Myers, 1987). If livestock grazing, recreation, or land use authorization actions provide opportunities for the community, particularly as it is associated with jobs, is it assumed the quality of life will increase for

those local residents. In addition, recreational opportunities can be included as a measure of community quality of life (Myers, 1987). As recreational opportunities increase, the quality of life for local residents is anticipated to increase.

Recreators

Recreation is a popular use of the planning area. The activities recreation stakeholders participate in are described in the *Recreation* section of Chapter 3. The quality of life for recreators (recreation and leisure time) would increase as the quality of their recreational experience increases. A quality recreation experience is a result of the availability of the desired activity and the setting in which that activity occurs. This is specific to the type of recreator and must be discussed separately as actions that increase the quality of life for one recreator may decrease the quality of life for another recreator.

Dispersed Recreators

The recreational experience for a dispersed recreator would increase as the number of opportunities to participate in hiking, camping, or another type of dispersed recreation increases. Setting is particularly important for dispersed recreators as they are often looking for an experience in a naturally-appearing landscape that does not contain roads, facilities, or evidence of use. Dispersed recreators often travel alone or in small groups. For dispersed recreators in the planning area, the most important characteristic of a quality experience is the ability to participate in their preferred activity while having few contacts with other groups.

Motorized Recreators

There are two types of motorized recreators in the planning area. One group, recreational riders, can be characterized as driving for pleasure. This group is looking for an experience similar to that of dispersed recreators where they can experience the natural landscape of the planning area with few contacts with other groups. These recreators may or may not want the ability to travel cross-county.

The second group, play riders, is seeking the ability to challenge their riding skills and test the ability of their machine through activities such as hill climbing and racing. This group is less concerned with participating in motorized recreation in a naturally-appearing landscape or the number of contacts with other recreators. They are interesting in riding their vehicle, despite surrounding conditions.

Hunters and Fishermen

“The universal value of the need for escape (relaxation and change) and for nature (natural and wild settings) are the primary motivations for hunters and fishermen (Sanyal et al., 2007). The most important motivation for mule deer hunters in the Idaho Department of Fish and Game’s Magic Valley Region is “doing something with family,” followed by “being with friends” and “developing close friendships” (Sanyal et al., 2007). Other types of hunting also occur on BLM lands within the planning area (upland game, waterfowl, etc.) and likely share these values of experience.

In a 2008 survey conducted by Responsive Management and the National Shooting Sports Foundation, Idaho hunters identified four factors important when choosing lands on which to hunt: the land is not crowded with other sportsmen, the land is public land, the land is easy to access by foot, and the land is familiar to them (Responsive Management and National Shooting Sports Foundation, 2009). When asked if any other factors where important in their decision-making process, hunters commonly mentioned a good game population and land without predator problems (Responsive Management and National Shooting Sports Foundation, 2009). A survey of mule deer hunters in the Magic Valley Region identified access to public lands and areas with the greatest chance of mule deer harvest as the most important influences on selecting a hunting area (Sanyal et al., 2007). The most important attributes for a quality hunting experience are being close to nature, bringing back memories, viewing scenery, seeing a deer in a natural setting, and doing something with family (Sanyal et al., 2007). Preserving these qualities would maintain or increase the quality of life for hunters in the planning area.

While river recreation is an important recreational opportunity in the planning area, none of the alternatives would alter the recreational experience to the degree that it would impact river recreators’ quality of life.

The following assumptions were used when analyzing impacts to social conditions:

- An increase in recreational opportunities would also increase the quality of life for local (non-ranching) residents.
- As the number of acres managed for the activities a particular recreation stakeholder group participates in increases, the quality of the recreation experience, and thus quality of life, for the stakeholder group would increase.
- More acres in a Travel Management Area with a focus on facilitating livestock grazing management would lead to an increased quality of life for ranchers.
- Management focus on a specific recreation activity would result in access that would be acceptable to the stakeholder group involved in that recreation activity.
- As the amount of wind energy development increases, the quality of life of ranchers decreases.
- Land use authorizations, including those for wind energy development, affect the setting of recreation opportunities for dispersed recreators and hunters and fishermen, decreasing their quality of life.
- The impact from wind energy development on motorized recreators is unclear.

Direct and Indirect Impacts

Impacts from Livestock Grazing Actions

Availability of forage for livestock grazing, expressed as animal unit months (AUMs), was used to evaluate impacts to the quality of life for planning area stakeholders. In addition, discussion of effort needed to reduce resource and use conflicts is also included to evaluate effects to quality of life.

Livestock grazing actions affect each of the stakeholder groups differently. Ranchers are expected to experience an increase in quality of life because an increase in forage allocated to livestock grazing would provide greater flexibility and thereby allow the rancher to become more profitable. In some cases, an increase in forage availability would allow families to continue the ranching tradition. Ranchers interviewed in the area had family members who would want to become ranchers if it were economically feasible (Evans, 2008).

The amount of effort required for livestock grazing management to reduce resource and use conflicts also impacts ranchers' quality of life. The more effort expended by a rancher on livestock management, the less time that rancher has to spend on recreation and leisure activities. While anticipated effort expended by ranchers as a result of actions under the alternatives is discussed in this section, the *Economic Conditions* section contains further discussion of impacts to permittees.

As forage availability increases, the quality of life for local communities may increase if ranchers take advantage of additional forage and thereby contribute more employment and income to the local economy (see the *Economic Conditions* section). Table 4-394 displays forage availability by alternative.

Livestock grazing actions are not expected to impact the quality of life of recreators.

Table 4-403. Forage Availability by Alternative (Animal Unit Months)

Allocation	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
AUMs at Initial Implementation of the Plan	200,000	189,000 to 259,000	350,000 to 423,000	273,000 to 344,000	94,000 to 147,000	97,000 to 151,000	46,000 to 93,000	216,000 to 326,000
AUMs at Full Implementation of the Plan	160,000 to 260,000	179,000 to 245,000	362,000 to 440,000	276,000 to 348,000	78,000 to 123,000	81,000 to 127,000	42,000 to 85,000	186,000 to 279,000

Impacts from Management Specific to the No Action Alternative

The No Action Alternative is unlikely to change social and economic measures influencing quality of life for ranchers as the amount of forage allocated to livestock grazing is unlikely to change. This would result in little change in associated employment and income. The amount of effort required to reduce resource and resource use conflicts is also unlikely to change, resulting in no change to recreation or leisure time for ranchers.

The quality of life for local (non-ranching) residents is unlikely to change as associated indirect and induced employment, and income are unlikely to change under the No Action Alternative.

Impacts from Management Specific to Alternative I

Quality of life for ranchers and local (non-ranching) residents in this alternative would be similar to the No Action Alternative.

Impacts from Management Specific to Alternative II

Alternative II would result in a larger increase in the quality of life of ranchers than any other alternative due to higher levels of forage allocated to livestock grazing, increasing associated employment, and income. Less effort would be required to reduce resource and resource use conflicts with more flexibility from additional allocated forage than the other alternatives, allowing ranchers more time to participate in recreation and leisure time. However, in some areas Special Recreation Management Area (SRMA) designation could create incidence of conflict resulting in some reduction to recreation or leisure time for ranchers.

The quality of life for local (non-ranching) residents would increase as associated indirect and induced employment, and income would increase under Alternative II as compared to the other alternatives.

Impacts from Management Specific to Alternative III

Alternative III would result in an increase in quality of life for ranchers due to higher levels of forage allocated than the No Action Alternative increasing associated employment, and income. Less effort would be required to reduce resource and resource use conflicts with more flexibility from additional allocated forage than the No Action Alternative, allowing ranchers more time to participate in recreation and leisure time. However, in some areas SRMA designation could create incidence of conflict, resulting in less time available for recreation and leisure activities.

The quality of life for local (non-ranching) residents would increase as associated indirect and induced employment, and income would increase under Alternative III as compared to the No Action Alternative.

Impacts from Management Specific to Alternative IV

Alternative IV would result in a decrease in quality of life for ranchers due to lower levels of forage allocated than the No Action Alternative decreasing associated employment and income. More effort would be required to reduce resource and resource use conflicts with less flexibility from reduced levels of allocated forage than the No Action Alternative. In addition the location of special designations such as Areas of Critical Environmental Concern (ACECs) and SRMAs could create incidence of conflict, resulting in less time available for recreation and leisure activities.

The quality of life for local (non-ranching) residents would decrease as associated indirect and induced employment, and income would decrease under Alternative IV as compared to the No Action Alternative.

Impacts from Management Specific to Alternative V

Alternative V would result in a larger decrease in the quality of life of ranchers than any other alternatives due to lower levels of forage allocated, decreasing associated employment and income. More effort would be required to reduce resource and resource use conflicts with less flexibility from reduced levels of allocated forage than the No Action Alternative. In addition the location of special designations such as ACECs and SRMAs could create incidence of conflict, resulting is less time available for recreation and leisure activities.

The quality of life for local (non-ranching) residents would decrease the most of all the alternatives with lower levels of indirect and induced employment, and income associated with this alternative.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI would result in an increase in quality of life for ranchers due to higher levels of forage allocated than the No Action Alternative increasing associated employment and income. Less effort would be required to reduce resource and resource use conflicts with more flexibility from additional allocated forage than the No Action Alternative, allowing ranchers more time to participate in recreation and leisure time. However, in some areas SRMA and Extensive Recreation Management Area (ERMA) designation could create incidence of conflict, resulting in less time available for recreation and leisure activities.

The quality of life for local (non-ranching) residents would increase as associated indirect and induced employment and income would increase under Alternative VI as compared to the No Action Alternative.

Impacts from Recreation Actions

Continuing population growth in the surrounding region is anticipated to increase demand for recreation opportunities in the planning area, ultimately increasing visitor use numbers, and potentially increasing employment and income associated with tourism in the region (see the *Economic Conditions* section). Management actions from recreation actions would benefit the quality of life of local (non-ranching) residents if those actions resulted in an increase in tourism expenditures in local communities. An increase in recreational opportunities would also increase the quality of life for local (non-ranching) residents. Table 4-403 displays the expected change of recreation visits in the planning area and the change in acres managed for recreation opportunities (Special Recreation Management Areas [SRMAs] and Extensive Recreation Management Areas [ERMAs]) by alternative.

Table 4-404. Expected Change in Recreation Visits and Acres Managed for Recreation Opportunities (Special and Extensive Recreation Management Areas) by Alternative

Indicator	Alternative						
	No Action	I	II	III	IV	V	VI
Expected Change in Recreation Visits	0 to 5% Increase	5 to 10% Increase	5 to 10% Decrease	0 to 5% Decrease	5 to 10% Increase	5 to 10% Decrease	5 to 10% Increase
Number of Acres Managed for Recreation Opportunities	86,000	325,000	7,000	42,000	190,000	5,000	324,000

Recreation management actions would influence the number, types, and quality of recreation opportunities available for various recreation stakeholder groups. Table 4-404 identifies the number of acres in SRMAs and ERMAs that would provide targeted management for the activities of the different recreation stakeholder groups. It is assumed that as the number of acres managed for the activities a particular recreation stakeholder group participates in increases, the quality of the recreation experience, and thus quality of life, for the stakeholder group would increase.

Table 4-405. Special and Extensive Recreation Management Area Management Benefiting Recreation Stakeholders by Alternative (Acres)

Recreation Stakeholder Group	Alternative						
	No Action	I	II	III	IV	V	VI
Dispersed	83,000	289,000	7,000	8,000	156,000	2,000	289,000
Motorized	3,000	36,000	0	34,000	34,000	3,000	35,000
Hunters and Fishermen	63,000	289,000	7,000	5,000	156,000	0	288,000

Management actions for recreation are anticipated to impact the quality of life of ranchers since SRMA and ERMA designation could create incidence of conflict, resulting in less time available for recreation and leisure activities. Management actions proposed for recreation are not anticipated to impact the quality of life of communities that support or oppose grazing. If these individuals also participate in recreational activities, impacts to their quality of life are addressed as impacts to the recreation stakeholder group.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, local communities would expect to see an increase in tourism-related expenditures since recreation visits are anticipated to increase up to 5% as a result of population increase. This would result in a small increase in associated employment and income, which could result in an increase in quality of life in the community. Quality of life dependent on the quantity and quality of recreation opportunities would not change.

Impacts from Management Specific to Alternative I

Recreation visits in the planning area are expected to increase by 5% to 10%. This would result in an increase in local expenditures from BLM recreation visitors and an increase in associated employment and income, relative to the No Action Alternative. As a result, individuals and local communities dependent on this employment and income would experience increases in their quality of life. Quality of life for local (non-ranching) residents would also be increased with the increase of recreation opportunities.

Alternative I nearly quadruples the number of acres managed for dispersed recreational experiences, which is expected to increase the quality of life for dispersed recreationists. This alternative would manage the most acres of all alternatives for motorized recreators, increasing their quality of life. The number of acres managed for hunting and fishing is the most of all alternatives, increasing the quality of life for hunters and fishermen.

Impacts from Management Specific to Alternative II

Management of recreation under Alternative II is expected to decrease recreational visits in the planning area by 5% to 10%. This would result in a decrease in local expenditures from BLM recreation visitors and a decrease in associated employment and income, relative to the other alternatives. As a result individuals and local communities dependent on this employment and income would experience decreases in their quality of life. As a result individuals and local communities dependent on this employment and income would experience increases in their quality of life. Quality of life due to the number of recreation opportunities available would decrease.

Under Alternative II, dispersed recreators, motorized recreators, hunters and fishermen are expected to experience a decrease in their quality of life due to fewer acres managed for those activities compared to the No Action Alternative.

Impacts from Management Specific to Alternative III

Due to recreation management under Alternative III, recreation visits in the planning area is expected to decrease by 0% to 5%. This would result in a decrease in local expenditures from BLM recreation visitors and a decrease in associated employment and income, relative to the other alternatives. As a result individuals and local communities dependent on this employment and income would experience decreases in their quality of life. Quality of life due to the number of recreation opportunities available would decrease.

Under Alternative III, dispersed recreators and hunters and fishermen are expected to experience a decrease in their quality of life due to fewer acres managed for those activities compared to the No Action Alternative. Alternative III would manage more acres for motorized recreators than the No Action Alternative, increasing their quality of life.

Impacts from Management Specific to Alternative IV

Management of recreation under Alternative IV is expected to increase recreational visits in the planning area by 5% to 10%. This would result in an increase in local expenditures from BLM recreation visitors and an increase in associated employment and income, relative to the No Action Alternative. As a result individuals and local communities dependent on this employment and income would experience increases in their quality of life. Quality of life for local (non-ranching) residents could also be increased as the number of managed recreation opportunities is expected to increase.

Alternative IV would have more than double the number of acres managed for dispersed recreational experiences. This is expected to increase the quality of life for dispersed recreators. Alternative IV would manage more acres for motorized recreators than the No Action Alternative, increasing their quality of life. The number of acres managed for hunting and fishing is two and a half times larger than under the No Action Alternative, increasing the quality of life for hunters and fishermen.

Impacts from Management Specific to Alternative V

Alternative V proposes less active management of recreation consequently, recreational visits in the planning area are expected to decrease by 5% to 10%. This would result in a decrease in local expenditures from BLM recreation visitors and a decrease in associated employment and income, relative to the other alternatives. As a result individuals and local communities dependent on this employment and income would experience decreases in their quality of life. The number of managed recreational opportunities is expected to decrease under Alternative V. This would result in a decrease in quality of life for local (non-ranching) residents.

Under Alternative V, dispersed recreators and hunters and fishermen are expected to experience a decrease in their quality of life due to fewer acres managed for those activities compared to the No Action Alternative. This alternative would manage the same number of acres for motorized recreators as the No Action Alternative, so would have no change in their quality of life.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Management of recreation under Alternative VI is expected to increase recreational visits in the planning area by 5% to 10%. This would result in an increase in local expenditures from BLM recreation visitors and an increase in associated employment and income, relative to the No Action Alternative. As a result individuals and local communities dependent on this employment and income would experience increases in their quality of life. Quality of life for local (non-ranching) residents would also be increased as the number of managed recreation opportunities increases.

Under Alternative VI, dispersed recreators, motorized recreators, hunters and fishermen are expected to experience an increase in their quality of life due to more acres managed for those activities compared to the No Action Alternative.

Impacts from Transportation and Travel Actions

During scoping, ranchers expressed the desire to conduct livestock management activities (such as placing salt and supplements, repairing fences, and seeing to injured livestock) through the use of motorized vehicles. Areas closed to motorized vehicle use may require increased effort to minimize conflicts between livestock grazing and resources or resource uses because permittees may have to access these areas on foot or horse, unless otherwise authorized (see the *Livestock Grazing* section). This would decrease the amount of time permittees have for recreation or leisure activities and increase cost of operation. In addition, some Travel Management Areas (TMAs) focus on facilitating livestock grazing management. It is assumed that more acres in a TMA with this focus would lead to an increased quality of life for ranchers.

Table 4-406. Travel Management Area Focus by Alternative (Acres)

TMA Focus	Alternative					
	I	II	III	IV	V	VI
Livestock Grazing	667,000	213,000	0	0	0	0
Dispersed Recreation	316,000	0	0	213,000	0	332,000
Motorized Recreation	41,000	0	34,000	34,000	3,000	35,000
Hunting [B]	348,000	0	0	1,015,000	0	1,005,000

[A] TMAs were not identified in the No Action Alternative.
[B] TMAs with a focus on big game habitat were assumed to benefit hunting.

Transportation and travel is directly related to access issues. In order to participate in recreational activities, the recreator must have access to their desired location. Because access can be achieved by hiking, horseback, biking, and motorized vehicles, different recreation stakeholder groups place different values on motorized access. Motorized access may not be as important for dispersed recreators as increased access often leads to increased use. As dispersed recreators are looking for a solitary experience, they may appreciate the lack of access to their desired location. However, the quality of the recreation experience for certain subgroups of motorized recreators increases with more access because it allows them to participate in their chosen activity in more locations. However, large increases could lead to crowding and lower of the quality of recreation experience for motorized recreators. Crowding could also occur if opportunities for motorized recreational use are reduced in the planning area or other recreation areas such as Forest Service lands and State parks.

Access is an important issue for hunters and fishermen. Research indicates that difficulty with access to lands for hunting has become a factor in the recruitment and retention of sportsmen (Responsive Management and National Shooting Sports Foundation, 2009). For this analysis, it is assumed that a decrease in access would result in a decrease in the quality of life for hunters. Because none of the alternatives would prohibit access to important fishing areas in the planning area, fishermen were not included in the analysis.

Because recreators within the same stakeholder group may have different values related to motorized access, the management focus of TMAs was used to determine the impact of transportation and travel management actions on the recreator stakeholder groups. It was assumed that a management focus on the specific recreation activity would result in access that would be acceptable to the stakeholder group. The number of acres with a TMA focus on motorized recreation, dispersed recreation, and hunting are identified in Table 4-406.

Impacts from transportation and travel actions are not anticipated to impact the quality of life for local (non-ranching) residents or the populations supporting or opposing livestock grazing.

Impacts from Management Specific to the No Action Alternative

Travel management in the No Action Alternative would result in minimal additional effort to reduce livestock grazing conflicts with resources and uses, resulting in no change in quality of life and the time available for ranchers to participate in recreation and leisure activities. There are no TMAs focusing on livestock grazing management in the No Action Alternative, further resulting in no change to the quality of life of ranchers.

Transportation and travel management is unlikely to change the quality of life for recreators under the No Action Alternative because there are no TMAs to focus travel management on recreational activities.

Impacts from Management Specific to Alternative I

Travel associated with TMAs would increase the amount of effort needed to reduce livestock grazing conflicts with recreation uses in some areas, resulting in a decrease in the quality of life of ranchers due to less time available to participate in recreation and leisure activities than under the No Action Alternative. However, 667,000 acres would have a TMA focus on livestock grazing management. This would moderate the decrease in quality of life for some ranchers.

Under Alternative I, 316,000 acres would have a TMA focus on dispersed recreation and 348,000 acres would have a TMA focus on hunting. This would increase the quality of life of these stakeholder groups. Alternative I includes 41,000 acres in a TMA focusing on motorized recreation. While motorized recreators may experience some decrease in quality of life due to less areas open to cross-country motorized vehicle use than under the No Action Alternative, more acres would be managed for their specific recreation activity.

Impacts from Management Specific to Alternative II

Travel under Alternative II associated with TMAs would increase the amount of effort needed to reduce livestock grazing conflicts with recreation uses in some areas, resulting in a decrease in the quality of life and the time available for ranchers to participate in recreation and leisure activities than under the No Action Alternative. However, 213,000 acres would be managed with a focus on livestock grazing management. This would moderate the decrease in quality of life for some ranchers and result in a slight increase in the quality of life of other ranchers.

Under Alternative II, none of the TMAs would focus on dispersed recreation, motorized recreation, or hunting. Relative to the No Action Alternative this would result in no change to the quality of life of these stakeholder groups.

Impacts from Management Specific to Alternative III

Travel in Alternative III associated with TMAs would increase effort to reduce conflicts between livestock grazing and recreation uses in some areas, resulting in decrease in quality of life due to less time available for ranchers to participate in recreation and leisure activities than under the No Action Alternative. None of the TMAs in Alternative III have a focus on livestock grazing management, resulting in the decrease in quality of life for ranchers.

Under Alternative III, 34,000 acres would be managed with a TMA focus on motorized recreation. While this is less than under Alternative I, it still provides more focused management than under the No Action Alternative, resulting in an increase in the quality of life for motorized recreators. Alternative III does not have TMAs focusing on dispersed recreation or hunting, resulting in no change in the quality of life for these stakeholder groups relative to the No Action Alternative.

Impacts from Management Specific to Alternative IV

Travel in Alternative IV associated with TMAs would require more effort to reduce conflicts between livestock grazing and recreation uses in some areas, resulting in a decrease in the quality of life for ranchers due to less time to participate in recreation and leisure activities than under the No Action Alternative. None of the TMAs in Alternative IV have a focus on livestock grazing management resulting in the decrease in quality of life for ranchers.

Under Alternative IV, 213,000 acres would be managed with a TMA focus on dispersed recreation, 34,000 acres with a focus on motorized recreation, and 1,015,000 acres with a focus on hunting. Alternative IV has more TMA acreage focusing on hunting than the other alternatives resulting in the greatest increase in quality of life for these recreators.

Impacts from Management Specific to Alternative V

Travel management in Alternative V associated with TMAs would require more effort to reduce conflicts between livestock grazing and recreation uses in some areas, resulting in a decrease in the quality of life for ranchers due to less time to participate in recreation and leisure activities than under the No Action Alternative. None of the TMAs in Alternative V focus on livestock grazing management, resulting in no improvement in quality of life for ranchers.

Under Alternative V, 3,000 acres would be managed with a TMA focus on motorized recreation. This would result in no change in the quality of life for motorized recreators. Alternative V does not have TMAs focusing on dispersed recreation or hunting, resulting in no change in the quality of life for these stakeholder groups relative to the No Action Alternative.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Travel designations in Alternative VI associated with TMAs would increase effort to reduce conflicts between livestock grazing and recreation uses in some areas, resulting in decrease in quality of life due to less time available for ranchers to participate in recreation and leisure activities than under the No Action Alternative. None of the TMAs in Alternative VI have a focus on livestock grazing management, resulting in no improvement in quality of life for ranchers.

Under Alternative VI, 35,000 acres would be managed with a TMA focus on motorized recreation while 332,000 acres would be managed for dispersed recreation. While this is less than under Alternative I, it still provides more focused management than under the No Action Alternative, resulting in an increase in the quality of life for motorized and dispersed recreators. Alternative VI has the second most TMA acreage focusing on hunting resulting in the second greatest increase in quality of life for these recreators.

Impacts from Land Use Authorizations Actions

Construction and structures can displace livestock, result in more concentrated grazing, and ultimately require more effort to minimize resource and resource use conflicts. In some cases, and to varying degrees, compatibility between wind energy development and other uses exists including some types of grazing. This analysis assumes that as the amount of wind energy development increases, the quality of life of ranchers is anticipated to decrease.

Opinions about wind energy may change throughout the planning process. It has been demonstrated that opposition to projects is weaker before a local project is proposed, strongest at the planning phase, and weaker after the facility has become operational (van der Horst, 2007). Thus the impact of wind energy development on local (non-ranching) residents may change throughout development of the project. Based on the trend noted above opposition during the planning phase will manifest itself as a decrease in the quality of life for local (non-ranching) residents in the short term. In the long term, wind energy development has the potential to contribute to the economies of local communities (see the *Economic Conditions* section).

Land use authorizations, including those for wind energy development, have the potential to affect the setting of recreation opportunities for dispersed recreators and hunters and fishermen, decreasing their quality of life (see the *Recreation* section). While the relationship between wind energy development and big game populations is not definitive, there is some indications of negative impacts due to habitat loss and increased human presence (Arnett et al., 2007). This could further decrease the quality of life for hunters as the wind energy development assumed for the analysis under the No Action Alternative and Alternatives I and II[12] would occur in big game habitat. The combination of a change in setting and a potential change in big game population would result in a decrease in quality of life for hunters. The impact from wind energy development on motorized recreators is unclear.

Management for land use authorizations is not expected to affect the quality of life for the populations that support or oppose livestock grazing.

Table 4-407. Expected Wind Energy Development by Alternative (Acres)

	Alternative						
	No Action	**I**	**II**	**III**	**IV**	**V**	**VI**
Number of Acres	110,000	39,000	127,000	50,000	37,000	31,000	22,000

[12] The assumption of where wind energy developments would occur is based on assumptions in the *Economic Conditions* section.

Impacts from Management Specific to the No Action Alternative

The No Action Alternative has the second highest amount of acreage behind Alternative II within expected wind energy development areas. If wind development occurred at a level commensurate with expected wind energy development areas, this alternative would result in the second most loss of forage availability and effort needed to reduce livestock grazing conflicts. Thus, it would have the second largest potential decrease in quality of life for ranchers.

Wind energy development could increase the quality of life for local (non-ranching) residents by increasing employment, and income in the long term; however there would likely be short-term decreases in quality of life due to opposition during the planning phase. The long-term increase and short-term decrease in quality of life would be the second largest behind Alternative II, if development is commensurate with expected wind energy development areas.

Wind energy development could decrease the quality of life for dispersed recreators if opportunities for natural scenery viewing and the settings for primitive hiking and camping are affected. Further, wind energy development may occur in big game winter range, resulting in decreases in the quality of life of hunters if populations of big game species or their patterns of migration are affected. The decrease in quality of life for dispersed recreators and hunters would be the second largest behind Alternative II, if development is commensurate with expected wind energy development areas.

Impacts from Management Specific to Alternatives I, III, IV, and V

Alternatives I, III, IV, and V are amongst those alternatives with low amounts of acreage with expected wind energy development areas and have similar acreages of expected wind energy development areas. If wind energy development occurred at a level commensurate with expected wind energy development areas then these alternatives would result in less loss of forage availability and effort needed to reduce livestock grazing conflicts than the No Action Alternative and Alternative II. Thus, these alternatives would have a low potential decrease in quality of life for ranchers.

Wind energy development could increase the quality of life for local (non-ranching) residents by increasing employment, and income in the long term; however there would likely be short-term decreases in quality of life due to opposition during the planning phase. The long-term increase and short-term decrease in quality of life would be lower under Alternatives I, III, IV, and V than the No Action Alternative and Alternative II, if development is commensurate with expected wind energy development areas.

Wind energy development could decrease the quality of life for dispersed recreators if opportunities for natural scenery viewing and the settings for primitive hiking and camping are affected. Further, wind energy development may occur in big game winter range, resulting in decreases in the quality of life of hunters if populations of big game species or their patterns of migration are affected. The decrease in quality of life for dispersed recreators and hunters would be lower under Alternatives I, III, IV, and V than the No Action Alternative and Alternative II, if development is commensurate with expected wind energy development areas.

Impacts from Management Specific to Alternative II

Alternative II has the highest amount of acreage within expected wind energy development areas. If wind development occurred at a level commensurate with expected wind energy development areas then this alternative would result in the largest loss of forage availability and the most effort needed to reduce livestock grazing conflicts. Thus it would have the largest potential for decrease in the quality of life of ranchers.

Wind energy development could increase the quality of life for local (non-ranching) residents by increasing employment, and income in the long term; however there would likely be short-term decreases in quality of life due to opposition during the planning phase. The long-term increase and short-term decrease in quality of life would be the largest of all the alternatives, if development is commensurate with expected wind energy development areas.

Wind energy development could decrease the quality of life for dispersed recreators if opportunities for natural scenery viewing and the settings for primitive hiking and camping are affected. Further, wind energy development may occur in big game winter range, resulting in decreases in the quality of life of hunters if populations of big game species or their patterns of migration are affected. The decrease in quality of life for dispersed recreators and hunters would be the largest of all the alternatives, if development is commensurate with expected wind energy development areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Alternative VI has the lowest amount of acreage with expected wind energy development areas. If wind energy development occurred at a level commensurate with expected wind energy development areas, then this alternative would result in less loss of forage availability and effort needed to reduce livestock grazing conflicts than the No Action Alternative and Alternative II. Thus, this alternative would have the lowest potential decrease in quality of life for ranchers.

Wind energy development could increase the quality of life for local (non-ranching) residents by increasing employment and income in the long term; however, there would likely be short-term decreases in quality of life due to opposition during the planning phase. The long-term increase and short-term decrease in quality of life would be lower under Alternatives I, III, IV, V, and VI than the No Action Alternative and Alternative II, if development is commensurate with expected wind energy development areas.

Wind energy development could decrease the quality of life for dispersed recreators if opportunities for natural scenery viewing and the settings for primitive hiking and camping are affected. Further, wind energy development may occur in big game winter range, resulting in decreases in the quality of life of hunters if populations of big game species or their patterns of migration are affected. The decrease in quality of life for dispersed recreators and hunters would be lower under Alternatives I, III, IV, V, and VI than the No Action Alternative and Alternative II, if development is commensurate with expected wind energy development areas.

Summary of Direct and Indirect Impacts

The following discussion attempts to summarize the direct and indirect impacts on stakeholder groups in the planning area. Information presented above on impacts under the alternatives to quality of life for various stakeholder groups are summarized below in the seven tables for each alternative below. An increased quality of life would be a beneficial impact; conversely a decreased quality of life would be an adverse impact.

Impacts from the No Action Alternative

For the most part, the No Acton Alternative will not result in changes to quality of life for stakeholders in the planning area. There may be some increase in quality of life to local (non-ranching) residents due to increased employment and income associated with slight increases in recreation visitation and wind energy development; however, expected wind energy development could decrease the quality of life for ranchers, dispersed recreators, and hunters.

Table 4-408. Impacts to Quality of Life from the No Action Alternative

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	No Change	NA	No Change	Decrease
Local (Non-Ranching) Residents	No Change	Increase	NA	Increase
Dispersed Recreators	NA	No Change	No Change	Decrease
Motorized Recreators	NA	No Change	No Change	NA
Hunters and Fishermen	NA	No Change	No Change	Decrease

Impacts from Alternative I

For the most part, Alternative I would result in an increase in the quality of life for stakeholders in the planning area. Some decreases in quality of life may be experienced due to transportation and travel management.

Table 4-409. Impacts to Quality of Life from Alternative I

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	No Change	NA	Decrease	Decrease
Local (Non-Ranching) Residents	No Change	Increase	NA	No Change
Dispersed Recreators	NA	Increase	Increase	Decrease
Motorized Recreators	NA	Increase	Decrease	NA
Hunters and Fishermen	NA	Increase	Increase	Decrease

Impacts from Alternative II

Alternative II would result in varying impacts on quality of life for stakeholders in the planning area. The quality of life for local (non-ranching) residents and recreational riders is likely to increase, while the quality of life for dispersed recreators, play riders, and hunters and fishermen is likely to decrease. The quality of life of ranchers is likely to increase, unless wind energy development occurs.

Table 4-410. Impacts to Quality of Life from Alternative II

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	Increase	NA	Increase	Decrease
Local (Non-Ranching) Residents	Increase	Decrease	NA	No Change
Dispersed Recreators	NA	Decrease	No Change	Decrease
Motorized Recreators	NA	Decrease	No Change	NA
Hunters and Fishermen	NA	Decrease	No Change	Decrease

Impacts from Alternative III

Alternative III would result in varying impacts on quality of life for stakeholders in the planning area. Local (non-ranching) residents and motorized recreators are likely to experience an increase in quality of life, while hunters and fishermen are likely to experience a decrease in quality of life. It is difficult to determine an overall change in the quality of life for ranchers and dispersed recreators under Alternative III.

Table 4-411. Impacts to Quality of Life from Alternative III

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	Increase	NA	Decrease	Decrease
Local (Non-Ranching) Residents	Increase	Decrease	NA	No Change
Dispersed Recreators	NA	Decrease	No Change	Decrease
Motorized Recreators	NA	Increase	Increase	NA
Hunters and Fishermen	NA	Decrease	No Change	Decrease

Impacts from Alternative IV

Alternative IV would result in varying impacts on quality of life of stakeholders in the planning area. All recreators' stakeholder groups would likely experience an increase in their quality of life, while ranchers would experience a decrease in their quality of life.

Table 4-412. Impacts to Quality of Life from Alternative IV

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	Decrease	NA	Decrease	Decrease
Local (Non-Ranching) Residents	Decrease	Increase	NA	No Change
Dispersed Recreators	NA	Increase	Increase	Decrease
Motorized Recreators	NA	Increase	Increase	NA
Hunters and Fishermen	NA	Increase	Increase	Decrease

Impacts from Alternative V

For the most part, Alternative V would result in a decrease in the quality of life for stakeholders in the planning area. Recreational riders would be the only stakeholder groups to experience an increase in their quality of life.

Table 4-413. Impacts to Quality of Life from Alternative V

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	Decrease	NA	Decrease	Decrease
Local (Non-Ranching) Residents	Decrease	Decrease	NA	No Change
Dispersed Recreators	NA	Decrease	No Change	Decrease
Motorized Recreators	NA	No Change	No Change	NA
Hunters and Fishermen	NA	Decrease	No Change	Decrease

Impacts from Alternative VI (Proposed RMP)

Alternative VI would result in varying impacts on quality of life for stakeholders in the planning area. Local (non-ranching) residents and motorized recreators are likely to experience an increase in quality of life. Hunters and fishermen are likely to experience an increase in quality of life with the large increase in Travel Management Areas (TMAs) focused on big game habitat under this alternative. While levels of grazing under this alternative are greater than under the No Action Alternative the TMA focus is less than under the No Action Alternative; consequently it is difficult to determine an overall change in the quality of life for ranchers.

Table 4-414. Impacts to Quality of Life from Alternative VI (Proposed RMP)

Stakeholder Group	Livestock Grazing	Recreation	Transportation and Travel	Land Use Authorizations
Ranchers	Increase	NA	Decrease	Decrease
Local (Non-Ranching) Residents	Increase	Increase	NA	No Change
Dispersed Recreators	NA	Increase	Increase	Decrease
Motorized Recreators	NA	Increase	Increase	NA
Hunters and Fishermen	NA	Increase	Increase	Decrease

Cumulative Impacts

The cumulative impact analysis area is the same as the analysis area for direct and indirect impacts: Elmore, Owyhee, and Twin Falls Counties, ID, and Elko County, NV.

Planning area social conditions can be affected by a variety of factors including population growth, location of new industries, recession, growth of new sectors, tax policy, State economic policy, etc. When compared to these variables, the management actions under this plan have relatively small effects on the regional social conditions. Because the changes in social activity presented above would be largely

unnoticeable regionally, there should be no cumulative economic effects regionally. However, for smaller areas within counties and communities in the impact area cumulative social effects may occur.

Effects from past social and economic activities have already been absorbed by local communities and are represented in the affected environment. Any change in the social and economic environment as a result of this management alternative would be in addition to the cumulative effect of past activities as presented in the affected environment section. In addition, cumulative effects would accrue alongside present activities occurring simultaneously in the region as well as those that could reasonably and foreseeably occur in the future.

Past, present, and reasonably foreseeable actions for the following resource and resource uses cumulatively affect social conditions:

- Recreation,
- Transportation and Travel, and
- Livestock Grazing.

Recreation and Travel Management

Travel management planning and land use plan revision is being undertaken on BLM-managed lands and national forests within the cumulative impact analysis area. The extent and nature of route designations and actions that affect recreation uses on BLM and Forest Service lands will determine the social and economic consequences for the area. Once this RMP is approved, the BLM will develop a transportation and travel management plan which will identify a network of routes that will support some current uses now taking place in the area or expected to take place in the future, which will include uses on adjacent BLM-managed lands and national forests.

Grazing

Population will continue to change within the planning area. Population increases in some areas suggest growing challenges associated with recreation uses and livestock use. Ranching, farming and the “rural lifestyle” are included in those traditional cultural patterns that persist in the area however, external forces related to population growth and shifts in regional economic bases have brought new changes (Wulfhorst et al., 2003). A reduction in the number of livestock grazing operations in the area has resulted as smaller family operations have been consolidated into larger “corporate” operations. Some farmers and ranchers have seen this as a sign of the times while others see the transfer of land or permits as a loss (Wulfhorst et al., 2003) that has manifested as a decrease in their quality of life.

4.6.2. Economic Conditions

Analysis Methods

Indicators

The following indicators were used for the analysis of impacts to economic conditions in the four-county region:

- Employment in the four-county region and
- Income in the four-county region.

The four-county region includes the following four counties: Elmore, Owyhee, and Twin Falls Counties, ID, and Elko County, NV.

Methods and Assumptions

Impacts to economic conditions from management in the following sections of Chapter 2 were analyzed in detail: *Upland Vegetation, Livestock Grazing, Fish*, *Wildlife, Recreation, Transportation and Travel, Land Use Authorizations, and Role of Amenities, Migration and Non-Market Values.* Impacts from management in the *Minerals* section were not analyzed since only small quantities of minerals are located in the

planning area and these uses are anticipated to continue under all the alternatives. Management from the remaining sections was not analyzed in detail because the management did not vary measurably between alternatives or impact the indicators for economic conditions.

Modeling the Four-County Regional Economy

In Chapter 3, the current trends and economic conditions of potentially affected communities are presented. To estimate the potential economic impacts of BLM management actions in the planning area, an inter-industry input-output economic model was developed using Impact Analysis for Planning (IMPLAN) Pro Software and Data (Minnesota IMPLAN Group, 2004). IMPLAN has been used in various BLM Resource Management Planning EISs to derive impacts from changes in economic activity, resource availabilities, and other BLM management decisions.

The data used to run the IMPLAN model are for Elmore, Owyhee, and Twin Falls Counties, ID, and Elko County, NV. Conducting the economic analysis at the four-county scale is appropriate because there are few, if any, economic linkages within smaller areas of the planning area itself (e.g., there are no retail services). Even an analysis at the scale of the planning area will only capture purchases of basic goods and services because residents will travel to the larger communities of Twin Falls, Elko, and Mountain Home for purchases of more specialized goods and services. Employment and income effects will accrue within smaller areas of the four-county region; consequently impacts could be greater for smaller communities more dependent on particular economic sectors. Where appropriate, economic data from other sources are described to provide additional information even though those data may not be compatible with the four-county IMPLAN results.

Employment and labor income estimates developed for this analysis include direct, indirect, and induced economic effects measured using IMPLAN. Direct employment would, for example, be generated in the grazing sector. Additional employment would be generated as the affected livestock operators purchase services and materials as inputs ("indirect" effects) and ranchers spend their earnings within the local economy ("induced" effects). Direct, indirect, and induced effects are combined in the discussion of effects below.

Theoretically, expenditures associated with changes in final demand would be available and specific enough to allocate to each of the 440 sectors contained in the IMPLAN model. In the absence of primary data, national-level production functions are used. Expenditures should be delineated between local and non-local providers, as purchases out of the economic study region would have no local economic impact. IMPLAN's data contains information which describes the proportion of a given commodity that would be provided by local producers. Previous modeling experience has shown that the data contained in the IMPLAN modeling system for the various sectors are an accurate representation of impacts.

Table 4-415 summarizes the characteristics of the four-county economy as represented by IMPLAN. Data for the 220 IMPLAN economic sectors occurring in the four-county region were aggregated by North American Industry Classification System (NAICS) Sector, the standard used by Federal statistical agencies in classifying business establishments[13]. These sectors contained over 88,000 jobs (full and part-time jobs), and employees earned $3.6 billion in the form of employee compensation (wages) and proprietor income (owner profit).

Table 4-415. Employment and Income by Sector for the Four-County Region

IMPLAN Sector	Employment (# of Full- and Part-Time Jobs)	Labor Income
Agriculture and Forestry Support Activities	5,774	$214,552,000
Mining	2,341	$226,131,000
Utilities	408	$35,997,000

[13] IMPLAN sectors and their corresponding NAICS code can be found in Appendix A of the IMPLAN Database Guide (Minnesota IMPLAN Group, 2004); the first two digits of the NAICS code correspond to the NAICS Sector, which can be viewed online at http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007.

IMPLAN Sector	Employment (# of Full- and Part-Time Jobs)	Labor Income
Construction	4,873	$232,692,000
Manufacturing	4,236	$191,335,000
Wholesale Trade	2,378	$141,970,000
Transportation and Warehousing	2,668	$131,075,000
Retail Trade	9,971	$263,518,000
Information	1,027	$35,399,000
Finance and Insurance	3,435	$123,609,000
Real Estate and Rental and Leasing	3,374	$26,591,000
Professional, Scientific, and Technical Services	3,177	$153,481,000
Management of Companies and Enterprises	437	$51,111,000
Administrative and Support and Waste Management and Remediation Services	4,139	$77,227,000
Educational Services	862	$21,166,000
Health Care and Social Assistance	7,965	$337,567,000
Arts, Entertainment, and Recreation	2,042	$39,401,000
Accommodation and Food Services	8,332	$172,923,000
Other Services	4,589	$126,133,000
Government	16,110	$1,022,615,000
Total	**88,136**	**$3,624,491,000**

Source: (Minnesota IMPLAN Group, 2004).

This economic impact analysis focuses on the aspects of the four-county region's economy that would be affected by management actions contained in Chapter 2. The following general assumptions were used when analyzing impacts to economic conditions:

- The IMPLAN model used in this analysis provides an unbiased representation of the economy of the four-county region.
- The year 2010, the most recent year data were available for the four counties, was a representative year.
- Economic impacts associated with *Upland Vegetation* actions are primarily related to those actions' effects on vegetation production and, therefore, forage available for livestock grazing.
- Economic impacts associated with *Fish* and *Wildlife* actions are primarily related to those actions' effects on fish and wildlife populations and, therefore, hunting and fishing.
- Economic impacts associated with *Livestock Grazing* actions are primarily related to those actions' effects on forage available for livestock grazing.
- Economic impacts associated with *Recreation* and *Transportation and Travel* actions are primarily related to those actions' effects on hunting, fishing, and motorized recreation.
- Economic impacts associated with *Land Use Authorizations* actions are primarily related to those actions' effects on areas available for wind energy development.
- BLM employees and payments made by the Federal government to local governments such as Payments-in-Lieu of Taxes would have direct economic impacts to the four-county region. However, since BLM employment and payments are not determined by actions in the RMP, these economic impacts are not addressed in this analysis.
- The alternatives establish areas to be managed for wilderness character, changes to Areas of Critical Environmental Concern (ACECs) and other special designations such as Visual Resource Management designations and Wild and Scenic River suitability determinations. These designations would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands.

Upland Vegetation and Livestock Grazing Impacts

One subset of the NAICS Agriculture, Forestry, Fishing, and Hunting Sector is the Cattle Ranching and Farming industry group; this industry group corresponds to the IMPLAN Cattle Ranching and Farming

Sector. This IMPLAN sector includes economic data related to both the beef and dairy cattle industries and is the IMPLAN sector most affected by livestock grazing in the planning area.

Overall, the NAICS Agriculture, Forestry, Fishing, and Hunting Sector ranks fifth in employment, and sixth in income among the NAICS Sectors in the four-county economy. Within the NAICS Agriculture, Forestry, Fishing, and Hunting Sector, the Cattle Ranching and Farming Sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) was responsible for 22% of employment (1,254 jobs) and 16% ($34.6 million) in labor income. However, the value and ranking of industry sector output and employment do not by themselves reveal the importance of an economic sector. Another way to view the importance of an economic sector to an area's economy is by the sector's contribution to the local economic base. Economic base or basic sectors are those that export to economies outside the area's boundaries. These sectors bring dollars into the local economy for expanded economic development. The Cattle Ranching and Farming Sector ranked second among the 220 IMPLAN sectors in the four-county region in value of exports. This export value is an indication of the importance of the Cattle Ranching and Farming Sector to economic development in the four-county region.

The connection between BLM management actions and the Cattle Ranching and Farming Sector is based on management of livestock grazing and rangeland resources. Cattle ranchers can be authorized use of BLM allotments for livestock grazing through grazing permits. The amount of livestock grazing on BLM-managed lands is measured in animal unit months (AUMs). Cattle ranches use BLM grazing as part of a forage resource rotation that includes base property (i.e., private grazing land owned by the rancher) and other resources. Assuming that Federal AUMs are part of an overall grazing system, a change in BLM livestock grazing management can affect the optimal use of the forage resources throughout the planning area. Furthermore, based on discussions with other rangeland-managing agencies such as the Forest Service, there is not any significant additional rangeland currently available in the four-county region. Therefore, reductions in AUMs on planning area lands cannot be replaced by increased AUMs in another nearby location.

One of the key relationships between livestock grazing management actions by the BLM and rancher income is illustrated below. Table 4-416 shows the income received and expenses paid by agricultural producers in the four-county region from 1996 through 2011 (Bureau of Economic Analysis, 2009; 2013). Yearly values are shown for cash receipts and other income, production expenses, realized net income, and farm labor and proprietors' income. Total cash receipts from agricultural operations in 2006 were estimated to be almost one billion dollars. Realized net incomes ranged from a high of almost $220 million in 2004 to a low of about $90 million in 1997.

Table 4-416. Income Received and Expenses Paid by Farmers in the Four-County Region, 1996-2011

Year	Cash Receipts and Other Income [A]	Production Expenses [B]	Realized Net Income [C]	Farm Labor and Proprietors' Income [D]
1996	$647,422,000	$536,538,000	$110,884,000	$138,853,000
1997	$679,716,000	$588,240,000	$91,476,000	$139,754,000
1998	$690,144,000	$562,075,000	$128,069,000	$168,882,000
1999	$705,700,000	$574,741,000	$130,959,000	$181,419,000
2000	$755,092,000	$621,136,000	$133,956,000	$149,613,000
2001	$862,231,000	$663,403,000	$198,828,000	$197,625,000
2002	$884,032,000	$749,008,000	$135,024,000	$178,833,000
2003	$896,399,000	$756,345,000	$140,054,000	$160,352,000
2004	$970,309,000	$750,466,000	$219,843,000	$191,983,000
2005	$987,175,000	$795,788,000	$191,387,000	$177,557,000
2006	$986,767,000	$853,610,000	$133,157,000	$156,964,000
2007	$1,250.578.000	$914,100,000	$336,478,000	$345,798,000
2008	$1,352,104,000	$951,940,000	$400,164,000	$378,330,000
2009	$1,145,441,000	$930,591,000	$214,850,000	$301,306,000

Year	Cash Receipts and Other Income [A]	Production Expenses [B]	Realized Net Income [C]	Farm Labor and Proprietors' Income [D]
2010	$1,234,927,000	$917,825,000	$362,102,000	$342,930,000
2011	$1,582,654,000	$1,075,036,000	$519,529,000	$438,047,000
Average	**$958,674,200**	**$765,052,625**	**$215,422,500**	**$228,015,375**
Standard Deviation	**$270,986,136**	**$164,367,852**	**$123,896,981**	**$97,818,132**
Coefficient of Variation	**0.2827**	**0.2148**	**0.5751**	**0.4290**

Source: (Bureau of Economic Analysis, 2009; 2013).
[A] Includes cash receipts from farm marketing of crops and livestock; receipts from other farm-related activities, including recreational services, sales of forest products, and custom-feeding services performed by farm operators; payments to farmers under several Federal Government farm subsidy programs; imputed value of home consumption, which is the value of the farm products produced and consumed on farms; and imputed gross rental value of farm dwellings.
[B] Includes expenditures incurred by farm operators in the production of agricultural commodities, including livestock and crops; major expense categories are inputs to the production process (feed, livestock and poultry, seed, fertilizer, etc.), labor (cash wages, employer contributions to social security, perquisites, and contract labor expenses), and other (interest, net rent paid to non-operator landlords, capital consumption, property taxes, etc.).
[C] Realized net income consists of cash receipts and other income less production expenses.
[D] Includes net farm proprietors' income and the wages and salaries, pay-in-kind, and other labor income of hired farm laborers arising directly from the current production of agricultural commodities, either livestock or crops; but specifically excludes the income of non-family farm corporations.

Table 4-416 illustrates the economic variability in the agricultural sector with estimates of standard deviation and coefficient of variation[14]. The coefficient of variation for production expenses is relatively low. This means that, although output prices may have varied, production expenses or purchase linkages with other sectors of the four-county economy have been relatively constant. The data suggest that agricultural producers in the four-county region faced with variable output prices would likely maintain their local input purchase linkages and realize lower net returns to their operation rather than purchase outside the region or change their operation. This means that changes to BLM livestock grazing management actions would have a direct impact on the four-county economy regardless of economic conditions.

The economic activity that occurs within the planning area economy as a result of one AUM of livestock production is estimated using the IMPLAN model for the four-county region. The IMPLAN model was used to estimate this multiplier effect by estimating transactions between permittees and the various sectors of the four-county region and its households. The multiplier effect means that each AUM of production value generates an estimated 0.00186 jobs and $31.47 in labor earnings. This represents one job per approximately 536 AUMs. These multipliers are summarized in Table 4-417.

Table 4-417. Estimated Economic Impact of One Animal Unit Month in the Planning Area (2010 Dollars)

	BLM Grazing	Ranch Production Perspective
Number of Jobs (Employment)	0.00186	0.00407
Labor Earnings (Income)	$31.47	$68.92

Estimating the contribution of livestock grazing on the planning area using only BLM AUMs may underestimate the actual importance of the BLM as a forage resource if BLM AUMs are part of an overall grazing system; where a change in BLM grazing affects the optimal use of the rest of forage resources that occur on other lands. A previous study by Alevy and others (2007) in Elko County, NV, estimated that one public land AUM supports 2.19 AUMs at the ranch level. From the perspective of total ranch production, a public land AUM has a total impact of 0.00407 jobs and $68.92 in labor earnings as shown.

[14] Coefficient of variation is the standard deviation divided by the average value of the variable.

Economic impacts are measured in terms of changes in employment, and income for each alternative as estimated from the Ranch Production Perspective. Income is expressed as total labor earnings, which is the sum of employee compensation and proprietor income as defined by the IMPLAN model. The BLM grazing estimates are not used in the impact estimate, since as noted above, the full effect of forage resource management practices in the planning area are better characterized considering additional indirect effects from the Ranch Production Perspective. Using the Ranch Production Perspective captures the maximum potential economic impacts associated with an alternative.

Employment and income impacts from livestock grazing were calculated for the estimated number of AUMs for livestock in each alternative, both at initial and full plan implementation. These AUM estimates incorporate management regarding areas available or unavailable for livestock grazing, the amount of vegetation production allocated for livestock, and the type and amount of upland vegetation treatments proposed in each alternative. These AUM estimates are discussed in more detail in the *Livestock Grazing* section.

Table 4-418. Estimated Animal Unit Months for Livestock at Initial and Full Plan Implementation by Alternative

AUMs	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Initial Plan Implementation	200,000	189,000 to 259,000	350,000 to 423,000	273,000 to 344,000	94,000 to 147,000	97,000 to 151,000	46,000 to 93,000	216,000 to 326,000
Full Plan Implementation [A]	160,000 to 260,000	179,000 to 245,000	362,000 to 440,000	276,000 to 348,000	78,000 to 123,000	81,000 to 127,000	42,000 to 85,000	186,000 to 279,000

[A] For all alternatives, AUMs at full plan implementation reflect the number of AUMs that would be available for livestock if the alternative's vegetation treatment objectives are achieved.

Employment and income in the four-county region resulting from estimated AUMs under the alternatives were compared to employment and income resulting from the baseline AUM levels (151,000 AUMS) which are based on the average of the actual billed AUMs from 2008 to 2011. This comparison is presented in two ways:

- **As a percent relative to employment, and income for the baseline level of actual billed AUMs** – This comparison depicts the economic impact of livestock grazing management in an alternative with respect to the economic impact of current livestock grazing management.
- **As a contribution to employment and income in the grazing sectors (Cattle Ranching and Farming Sector and the sector containing sheep grazing).** – This comparison depicts the direct economic impact of livestock grazing management under the alternatives with respect to those sectors of the four-county region directly affected.

The following assumptions specific to livestock grazing were used when analyzing impacts to economic conditions:

- AUMs on BLM-managed lands are part of an overall grazing system, and changing AUMs affects the optimal use of other sources of forage resources off BLM-managed lands in the planning area. There is no excess grazing capacity that can be substituted for BLM-managed grazing lands.
- The ranch production effects are similar for cattle- and sheep-based grazing operations.
- The AUM valuation estimates listed in Table 4-417 are reasonable and unbiased. There is uncertainty in these estimates because each ranch in the planning area is unique and not completely represented by the representative ranches used to develop the AUM values. The error introduced by these estimates is random and, therefore, unbiased. No estimate of the degree of uncertainty was made.
- Employment and income for the four-county region displayed in Table 4-415 already include employment and income resulting from the current level of AUMs under the No Action Alternative.

Fish, Wildlife, Recreation, and Transportation and Travel Impacts

Recreational activity in the planning area is diverse but consists mostly of dispersed recreation opportunities. Data collected by the Jarbidge Field Office staff between October 1, 2000 and September 30, 2011 indicated that the planning area had received 48,300 recreational visits over the ten year period. While traveling to lands within the planning area to recreate, these visitors often eat in local restaurants, shop in local retailers, and purchase gas and lodging. Residents and recreationists feel that the opportunities supported by BLM lands within the planning area are unique and responsible for attracting and maintaining visitor spending in the local economy. If these opportunities did not exist in the planning area, recreationalists and their expenditures would travel elsewhere. In this manner the recreational opportunities supported by BLM lands contribute to the four-county region economy by attracting and maintaining visitor spending within these four counties.

While changes in recreational use on BLM lands may occur in response to new management objectives under the action alternatives, current recreational use levels will continue to be supported under all alternatives, with the exception of Alternative IV. While current use levels would continue to be supported, increasing demand for nationally unique recreational experiences, like elk hunting, is anticipated to increase recreation visitation in the four- county region up to 5%; consequently local and non-local visitation under each alternative depicts this baseline increase in visitation over the 20 year planning period. As demand for recreational opportunities like camping, big game hunting, driving for pleasure, fishing, motorized recreation, and other forms of recreation increases, the contributions of recreation and tourism to the local economy will also increase in the planning area.

Table 4-419. Estimated Changes in Recreation Visitor Use and Recreation Spending by Alternative

	Alternative						
	No Action	**I**	**II**	**III**	**IV**	**V**	**VI**
% Change from Current Levels	0 to 5% Increase	5 to 10% Increase	0 to 5% Increase	5 to 10% Increase	5 to 10% Increase	5 to 10% Decrease	5 to 10% Increase
Total Visitor Days	19,540 to 20,517	20,517 to 21,494	19,540 to 20,517	20,517 to 21,494	20,517 to 21,494	17,586 to 18,563	20,517 to 21,494
Local Visitor Days	16,609 to 17,439	17,439 to 18,270	16,609 to 17,439	17,439 to 18,270	17,439 to 18,270	14,948 to 15,779	17,439 to 18,270
Non-Local Visitor Days	2,931 to 3,078	3,078 to 3,224	2,931 to 3,078	3,078 to 3,224	3,078 to 3,224	2,638 to 2,784	3,078 to 3,224

The following assumptions specific to recreation were used when analyzing impacts to economic conditions:

- The estimates of changes in recreation use are reasonable and unbiased. There is uncertainty in these estimates because it is difficult to project how recreators' behavior would change due to management affecting recreation in the planning area.
- Participation in various recreational activities supported by BLM lands in the area has been increasing and is anticipated to continue to increase over the 20 year planning period. In the absence of changes to management, which result in changes in recreational use, local and non-local recreation in the planning area is expected to increase up to 5% as demand for its nationally unique recreational experiences increases.

Land Use Authorizations Impacts

Land use authorizations include rights-of way (ROWs), land use permits, and leases. This section discusses economic impacts of management associated with wind energy development, ROWs, utility ROWs, roads, communication sites, and other land use authorizations. While many of the non-wind energy land use authorizations are not anticipated to have measureable economic impacts (employment and income) these actions indirectly support communities and economies in the area.

Discussion of effects from non-wind energy ROWs (communication sites, roads, utility line ROWs, and other land use authorizations) are shown in the *Land Use Authorizations* section. The discussion of wind

energy related effects considers the expected wind energy development areas in this table alongside potential economic impacts generated by the Jobs and Economic Development Impact Model, developed and maintained by the National Renewable Energy Laboratory (DOE, 2012). The model uses cost and local purchase relationships from existing wind energy projects across the nation and is reviewed by wind energy developers. Economic effects associated with construction (temporary) and operation (permanent) of one and a half and two megawatt (MW) turbines are presented below in Table 4-420.

Table 4-420. Economic Impacts for Wind Energy Projects per Turbine Size (in Full-time Employment Jobs and 2010 Dollars)

	1.5 MW	2.0 MW
Installed Project Cost	$3,004,262	$4,005,683
Direct Operating and Maintenance Costs	$30,000	$40,000
Total Employment (Temporary)	**10**	**13**
Total Labor Income	**$373,000**	**$498,000**
Total Employment (Permanent)	**0.3**	**0.4**
Total Labor Income	**$12,000**	**$16,000**

The following assumptions specific to land use authorizations were used when analyzing impacts to economic conditions:

- The major difference between alternatives with respect to non-wind energy ROWs is the areas available for various types of land use authorizations by alternative while the difference in alternatives with respect to wind energy ROW is expected wind development areas. These estimates are from the *Land Use Authorization* section.

Role of Amenities, Migration and Non-Market Values

The economic analysis assesses the economic effects of the direct use of resources in terms of jobs and income. This type of analysis does not include other types of economic value often referred to as non-market values. Non-market values are important to the well-being of visitors, area residents and others outside the planning area. These values include natural amenities, quality of life factors, recreational opportunities, ecosystem services and non-use values such as existence, option and bequest values. Non-market values are difficult to quantify and insufficient data exists to assess the effects of management actions. However, the fact that no monetary value is assigned to these values does not lessen their importance in the decision making process.

In addition, helpful inferences can be made. While there is a general consensus that non-use values exist, the methodologies for measuring these values are controversial and difficult to apply. Wilderness has been the subject of numerous non-use studies, usually conducted for specific natural areas; however no attempt has been made to directly elicit potential non-use values associated with any of the alternatives. The Final EIS describes areas to be managed for wilderness characteristics, changes to ACECs and other special designations such as Wild and Scenic River suitability and Visual Resource Management designations. These designations would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands.

Additionally, special designations and management of Lands with Wilderness Characteristics and VRM class I and II may attract new residents and tourists to the area which would then contribute to area economic activity. While in some cases land protection directly reduces employment in extraction based industries, it has been shown that natural amenities can offset job losses due to population growth (Eichman et al., 2010). Natural amenities and quality of life have been increasingly recognized as important factors in the economic prospects of many rural communities in the West (Rudzitis and Johnson, 2000). In addition, non-labor income is intimately tied to natural amenities as discussed in Chapter 3. Rural county population change, the development of rural recreation, and retirement-destination areas are all related to natural amenities (McGranahan, 1999). Thus, designations that maintain and protect natural amenities may similarly contribute to area economic well-being.

Direct and Indirect Impacts

Impacts from Upland Vegetation and Livestock Grazing Actions

The following indicators were used to analyze of impacts of Upland Vegetation and Livestock Grazing actions on economic conditions in the four-county region:

- Employment in the four-county region and
- Income in the four-county region.

Employment and income in the four-county region resulting from estimated animal unit months (AUMs) under the alternatives were compared to employment and income resulting from baseline AUM levels (151,000 AUMS) which are based on the average of the actual billed AUMs from 2008 to 2011. Table 4-412 displays these values.

Table 4-421. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Baseline (Actual Billed Use) Animal Unit Month Levels

Indicator	Current Billed AUMs
BLM Grazing	
Employment	281
Income	$4,751,970
Ranch Production Perspective	
Employment	615
Income	$10,406,814

Impacts from Management Specific to the No Action Alternative

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under the No Action Alternative are summarized in Table 4-422. The estimates reported are from BLM forage and the Ranch Production Perspective to capture the maximum potential economic impacts associated with this alternative.

Table 4-422. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under the No Action Alternative

Indicator	Initial Implementation	Full Implementation	
		Low AUM Estimate	High AUM Estimate
BLM Grazing			
Employment	372	298	484
Income	$6,294,000	$5,035,200	$8,182,200
Ranch Production Perspective			
Employment	815	652	1059
Income	$13,783,860	$11,027,088	$17,919,018

Employment and income under low and high estimates of initial and full forage implementation under this alternative would increase 6% to 72% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions would continue to be supported under low and high estimates of both initial forage and full forage implementation under this alternative.

Impacts from Management Specific to Alternative I

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under Alternative I are summarized in Table 4-423. Employment and income under low and high estimates of

initial and full forage implementation under this alternative would increase 19% to 72% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions would continue to be supported under low and high estimates of both initial forage and full forage implementation under this alternative.

Table 4-423. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Alternative I

Indicator	Initial Implementation		Full Implementation	
	Low AUM Estimate	High AUM Estimate	Low AUM Estimate	High AUM Estimate
BLM Grazing				
Employment	352	482	333	456
Income	$5,947,830	$8,150,730	$5,633,130	$7,710,150
Ranch Production Perspective				
Employment	770	1055	729	998
Income	$13,025,748	$17,850,099	$12,336,555	$16,885,229

Impacts from Management Specific to Alternative II

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under Alternative II are summarized in Table 4-424. Employment and income under low and high estimates of initial and full forage implementation under this alternative would increase 132% to 191% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions would continue to be supported under low and high estimates of both initial forage and full forage implementation under this alternative.

Table 4-424. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Alternative II

Indicator	Initial Implementation		Full Implementation	
	Low AUM Estimate	High AUM Estimate	Low AUM Estimate	High AUM Estimate
BLM Grazing				
Employment	651	787	673	818
Income	$11,014,500	$13,311,810	$11,392,140	$13,846,800
Ranch Production Perspective				
Employment	1426	1723	1475	1792
Income	$24,121,755	$29,152,864	$24,948,787	$30,324,492

Impacts from Management Specific to Alternative III

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under Alternative III are summarized in Table 4-425. Employment and income under low and high estimates of initial and full forage implementation under this alternative would increase 81% to 130% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions would continue to be supported under low and high estimates of both initial forage and full forage implementation under this alternative.

Table 4-425. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Alternative III

Indicator	Initial Implementation		Full Implementation	
	Low AUM Estimate	High AUM Estimate	Low AUM Estimate	High AUM Estimate
BLM Grazing				
Employment	508	640	513	647
Income	$8,591,310	$10,825,680	$8,685,720	$10,951,560
Ranch Production Perspective				
Employment	1112	1401	1124	1418
Income	$18,814,969	$23,708,239	$19,021,727	$23,983,916

Impacts from Management Specific to Alternative IV

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under Alternatives IV-A and IV-B are summarized in Table 4-426. Employment and income under low and high estimates of initial and full forage implementation under this alternative would range from 0% to a decrease of 48% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions could continue to be supported under low estimates of initial forage implementation but would be less under full forage implementation under this alternative. These effects would be greater for smaller areas within the four-county region.

Table 4-426. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Alternative IV

Indicator	Initial Implementation		Full Implementation	
	Low AUM Estimate	High AUM Estimate	Low AUM Estimate	High AUM Estimate
Alternative IV-A				
BLM Grazing				
Employment	175	273	145	229
Income	$2,958,180	$4,626,090	$2,454,660	$3,870,810
Ranch Production Perspective				
Employment	383	599	318	501
Income	$6,478,414	$10,131,137	$5,375,705	$8,477,047
Alternative IV-B				
BLM Grazing				
Employment	180	281	151	236
Income	$3,052,590	$4,751,970	$2,549,070	$3,996,690
Ranch Production Perspective				
Employment	395	615	330	517
Income	$6,685,172	$10,406,814	$5,582,463	$8,752,751

Impacts from Management Specific to Alternative V

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under Alternative V are summarized in Table 4-427. Employment and income under low and high estimates of initial and full forage implementation under this alternative would decrease 38% to 72% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions would not be supported under estimates of initial forage or full forage implementation under this alternative. These effects would be greater for smaller areas within the four-county region.

Table 4-427. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Alternative V

Indicator	Initial Implementation		Full Implementation	
	Low AUM Estimate	High AUM Estimate	Low AUM Estimate	High AUM Estimate
BLM Grazing				
Employment	86	173	78	158
Income	$1,447,620	$2,926,710	$1,321,740	$2,674,950
Ranch Production Perspective				
Employment	187	379	171	346
Income	$3,170,288	$6,409,495	$2,894,611	$5,858,141

Impacts from Management Specific to Alternative VI (Proposed RMP)

The estimated economic impacts from Upland Vegetation and Livestock Grazing actions under Alternative VI are summarized in Table 4-428. Employment and income under low and high estimates of initial and full forage implementation under this alternative would increase 23% to 116% compared to the baseline AUM levels.

Contributions to grazing sectors from BLM forage and its ranch production perspective contributions would continue to be supported under low and high estimates of both initial forage and full forage implementation under this alternative.

Table 4-428. Total Economic Impacts (Direct, Indirect, and Induced) from Livestock Grazing under Alternative VI (Proposed RMP)

Indicator	Initial Implementation		Full Implementation	
	Low AUM Estimate	High AUM Estimate	Low AUM Estimate	High AUM Estimate
BLM Grazing				
Employment	402	606	346	519
Income	$6,797,520	$10,259,220	$5,853,420	$8,780,130
Ranch Production Perspective				
Employment	880	1328	758	1136
Income	$14,886,569	$22,467,692	$12,818,990	$19,228,485

Impacts from Fish, Wildlife, Recreation, and Transportation and Travel Actions

The following indicators were used to analyze of impacts of Fish, Wildlife, Recreation, and Transportation and Travel actions on economic conditions in the four-county region:

- Employment in the four-county region and
- Income in the four-county region.

Table 4-429 displays impacts to employment and income to the four-county region from changes in recreation visitor use by alternative. These impacts were generated using the Impact Analysis for Planning (IMPLAN) model described previously.

Table 4-429. Recreation Economic Impacts by Alternative

Indicator	Current Recreation Use	Alternative						
		No Action	I	II	III	IV	V	VI
Local Visits								
Employment	7	7	7 to 8	7	7 to 8	7 to 8	7	7 to 8
Income	$187,000	$187,000 to $204,000	$204,000 to $213,000	$187,000 to $204,000	$204,000 to $213,000	$204,000 to $213,000	$175,000 to $184,000	$204,000 to $213,000

Indicator	Current Recreation Use	Alternative						
		No Action	I	II	III	IV	V	VI
Non-Local Visits								
Employment	7	7 to 8	8	7 to 8	8	8	6	8
Income	$173,000	$173,000 to $182,000	$182,000 to $191,000	$173,000 to $182,000	$182,000 to $191,000	$182,000 to $191,000	$156,000 to $165,000	$182,000 to $191,000

Impacts from Management Specific to the No Action Alternative

Compared to employment and income for current recreation use levels, changes would increase up to 5%. However, not all types of recreation activities are affected in the same way.

Hunting and fishing effort may increase and the quality of hunting and fishing experiences may decrease under the No Action Alternative because fish and big game populations are expected to experience minor to major adverse impacts (see the *Fish and Wildlife* section). In addition, under the No Action Alternative, new Special Recreation Management Areas (SRMAs) to provide focused management for hunting and fishing opportunities would not be designated. These actions and effects on fish and big game populations would result in reduced value of experience and would potentially reduce visitation for wildlife associated recreation.

Motorized recreation, on the other hand, is expected to expand in and adjacent to popular use areas, resulting in positive economic impacts; however, motorized recreation in the remainder of the planning area is expected to remain constant. Focused management for motorized recreation would be limited to the existing Hagerman-Owsley SRMA. In addition, the No Action Alternative would not include improved route designation, maps, and travel management, as in the action alternatives; thus, these benefits to the value of experience for motorized recreators who primarily recreate on routes would not be realized. These factors would partially offset positive economic effects from keeping the majority of the planning area open to cross-country motorized recreation.

Impacts from Management Specific to Alternative I

Relative to current levels, employment and income would increase between 5% and 10% under Alternative I. There would be more SRMAs and intensive management supporting motorized recreation and hunting activities under Alternative I than under any other alternatives, resulting in positive economic impacts.

Major beneficial impacts to big game populations under Alternative I (see the *Wildlife* section) as well as new SRMAs with focused management for big game hunting (e.g., the Canyonlands and Jarbidge Foothills SRMAs) may increase the quality of hunting experiences, resulting in positive effects to the value of wildlife associated recreation experiences. Even though fish are expected to experience minor adverse impacts (see the *Fish* section), new SRMAs would provide focused management for fishing (i.e., the Little Pilgrim and Salmon Falls Reservoir SRMAs) and would likely increase the quality and value of fishing experiences.

Creation of the Deadman/Yahoo SRMA would benefit motorized recreation as it would focus on providing enhanced opportunities for cross-country motorized recreation. Improved route designation, maps, and travel management would also contribute to the value of experience for motorized recreation opportunities, benefitting on- and off-route motorized recreators. These positive effects would be partially offset by limiting motorized vehicle use to designated routes in the majority of areas currently open to cross-country motorized vehicle use and increasing the acres closed to motorized vehicle use.

Impacts from Management Specific to Alternative II

Relative to current levels, employment and income could increase up to 5%. These impacts would be similar to those under the No Action Alternative, although they result from different factors.

The quality of hunting and fishing experiences may decrease under Alternative II because fish and big game populations are expected to experience minor to major adverse impacts (see the *Fish and Wildlife* section), resulting in negative effects to the value of wildlife associated recreation experiences. These effects may be partially offset by the creation of new SRMAs providing focused management for fishing (i.e., the Little Pilgrim and Salmon Falls Reservoir SRMAs) that would likely increase the quality and value of fishing experiences.

Eliminating all areas open for cross-country motorized vehicle use as well as the existing SRMA with a focus on motorized recreation would have a negative effect on motorized recreation, especially on motorized recreators who primarily recreate off routes. However, this effect may be partially offset by improved route designation, maps, and travel management, which would provide an increase in the value of experience for motorized recreators who primarily recreate on routes.

Impacts from Management Specific to Alternative III

Relative to current recreation use levels employment and income could increase between 5% and 10% under Alternative III. These impacts would be similar to those under Alternative I, although they result from different factors.

Moderate beneficial impacts to big game populations under Alternative III (see the *Wildlife* section) may increase the quality of hunting experiences, resulting in positive effects to the value of hunting experiences. Even though fish are expected to experience minor adverse impacts (see the *Fish* section), new SRMAs providing focused management for fishing (i.e., the Little Pilgrim and Salmon Falls Reservoir SRMAs) would likely increase the quality and value of fishing experiences.

Creation of the Deadman/Yahoo SRMA would benefit motorized recreation as it would focus on providing enhanced opportunities for cross-country motorized recreation, although the benefit would be slightly lower than in Alternative I due to the reduced area open to cross-country motorized vehicle use. Improved route designation, maps, and travel management would also contribute to the value of experience for motorized recreation opportunities, benefitting on- and off-route motorized recreators. These positive effects would be partially offset by limiting motorized vehicle use to designated routes in the majority of areas currently open to cross-country motorized vehicle use.

Impacts from Management Specific to Alternative IV

Relative to current recreation use levels, employment and income would increase between 5% and 10% under Alternative IV. These impacts would be similar to those under Alternatives I and III, although they result from different factors.

Major beneficial impacts to big game populations under Alternative IV (see the *Wildlife* section) as well as a new SRMA with focused management for big game hunting (e.g., the Canyonlands SRMA) may increase the quality of hunting experiences, resulting in positive effects to the value of hunting experiences. Minor beneficial impacts to fish populations (see the *Fish* section) as well as a new SRMA providing focused management for fishing (e.g., the Salmon Falls Reservoir SRMA) may increase the quality and value of fishing experiences; the effect would be less than in Alternatives I and III where the Little Pilgrim SRMA would also be created.

Creation of the Deadman/Yahoo SRMA would benefit motorized recreation as it would focus on providing enhanced opportunities for cross-country motorized recreation, although the benefit would be slightly lower than in Alternative I due to the reduced area open to cross-country motorized vehicle use. Improved route designation, maps, and travel management would also contribute to the value of experience for motorized recreation opportunities, benefitting on- and off-route motorized recreators. These positive effects would be partially offset by limiting motorized vehicle use to designated routes in the majority of areas currently open to cross-country motorized vehicle use and increasing the acres closed to motorized vehicle use to an even greater degree than under Alternative I.

Impacts from Management Specific to Alternative V

Relative to current recreation use levels, employment and income would decrease between 5% and 10%. However, not all types of recreation activities are affected in the same way.

Minor to moderate beneficial impacts to fish and big game populations under Alternative V (see the *Fish and Wildlife* section) may increase the quality of hunting and fishing experiences, resulting in positive effects to the value of fishing and hunting experiences. However, the lack of SRMAs with focused management for hunting or fishing would limit opportunities for increasing the quality and value of hunting and fishing experiences in the planning area.

Focused management for motorized recreation would be limited to the existing Yahoo SRMA, reducing opportunities for this type of recreation elsewhere in the planning area. Improved route designation, maps, and travel management would contribute to the value of experience for motorized recreation opportunities, mostly benefitting motorized recreators who primarily recreate on routes. These positive effects would be partially offset by limiting motorized vehicle use to designated routes in the majority of areas currently open to cross-country motorized vehicle use. In addition, Alternative V would have nearly three times the acreage closed to motorized vehicle use as compared to Alternative I. This includes closing all ways within Wilderness Study Areas, limiting access and recreational use of those areas.

Impacts from Management Specific to Alternative VI (Proposed RMP)

Relative to current recreation use levels employment and income would increase between 5% and 10% under Alternative VI. These impacts would be similar to those under Alternative I, although they result from different factors.

Moderate beneficial impacts to big game populations under Alternative VI (see the *Wildlife* section) may increase the quality of hunting experiences, resulting in positive effects to the value of hunting experiences. Even though fish are expected to experience minor adverse impacts (see the *Fish* section), new SRMAs providing focused management for fishing (i.e., the Little Pilgrim and Salmon Falls Reservoir SRMAs) would likely increase the quality and value of fishing experiences.

Creation of the Deadman and Yahoo SRMAs would benefit motorized recreation as it would focus on providing enhanced opportunities for cross-country motorized recreation, although the benefit would be slightly lower than in Alternative I due to the reduced area open to cross-country motorized vehicle use. Improved route designation, maps, and travel management would also contribute to the value of experience for motorized recreation opportunities, benefitting on- and off-route motorized recreators. These positive effects would be partially offset by limiting motorized vehicle use to designated routes in the majority of areas currently open to cross-country motorized vehicle use.

Impacts from Land Use Authorizations Actions

The following indicators were used to analyze of impacts of Land Use Authorization actions on economic conditions in the four-county region:

- Employment in the four-county region and
- Income in the four-county region.

Impacts from Management Specific to the No Action Alternative and Alternative II

Under the No Action Alternative and Alternative II, higher levels of wind energy development could be supported with higher acreage of expected wind energy development areas than the other alternatives. Under these alternatives the majority of the southeast corner of the planning area would be available for wind energy development, which could support commercial scale wind energy projects. Consequently, the No Action Alternative and Alternative II would provide more employment and income than the other alternatives if wind energy development were to occur. These impacts would consist of both construction-related economic effects (temporary) and impacts during operation (permanent). The employment and income effects of development would vary depending on the size of turbine and total project capacity.

Land use authorizations for rights-of-way (ROWs) that support communication sites, utility lines, and other land use authorizations support industries in the region and local communities that benefit from associated services. In turn, natural amenities and non-market values important to local communities may be adversely affected by development and are discussed below in the section on Role of Amenities, Migration and Non-market Values. Under the No Action Alternative the beneficial effects from non-wind energy ROWs (communication sites, roads, utility lines, and other land use authorizations) would be less than the other alternatives with fewer acres of communication site, road, and utility line ROWs and other land use authorizations within areas with constraints on location. Under Alternative II the beneficial effects would be greater than the No Action Alternative but less than Alternatives V and VI, if development is commensurate with acres within utility ROW corridors.

Impacts from Management Specific to Alternatives I, III, IV, V, and VI (Proposed RMP)

Alternatives I, III, IV, V, and VI provide fewer acres of expected wind energy development areas than the No Action Alternative and Alternative II. These alternatives make the majority of the southeast corner of the planning area unavailable for wind energy development and commercial scale wind energy projects are less likely to be supported. Consequently these alternatives would provide less employment and income than No Action Alternative and Alternative II if wind energy development were to occur. If development occurred impacts would consist of both construction-related economic effects (temporary) and impacts during operation (permanent). The effects of wind energy development would vary depending on the size of turbine (one and a half or two megawatt) and total project capacity.

Land use authorizations for ROW that support communication sites, utility lines, and other land use authorizations support industries in the region and local communities that benefit from associated services. In turn, natural amenities and non-market values important to local communities may be adversely affected by development and are discussed below in the section Role of Amenities, Migration and Non-market Values. Under Alternatives I, III, and IV the beneficial effects noted above from communication site and road ROWs and other land use authorizations would be less than the other alternatives (apart from the No Action Alternative) with fewer acres allowed within areas with constraints on location. Under Alternatives V and VI economic effects would be greater than the other alternatives in terms of acres of communication site and road ROWs and other land use authorizations, if development is commensurate with acres allowed within areas with constraints on location.

Under Alternatives I, III, IV, and V the beneficial effects noted above from utility line ROW site and other land use authorizations would be less than the Alternative VI (apart from the No Action Alternative) with fewer acres within expected utility development areas utility ROW corridors. Under Alternative VI the beneficial effects noted above would be greater than the other alternatives in terms of utility line ROW, if development is commensurate with acres within expected utility development areas utility ROW corridors.

Role of Amenities, Migration and Non-market Values

Areas of Critical Environmental Concern (ACECs); lands to be managed for wilderness characteristics; Wild and Scenic River (WSR) designated, suitable, and eligible segments; and Visual Resource Management (VRM) Class I and II may attract new residents and tourists to the area which would then contribute to area economic activity. In addition these designations would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands. Measures of these protected area designations are presented below in Table 4-430.

Impacts from Management Specific to the No Action Alternative

Under the No Action Alternative, non-market values associated with natural amenities differ according to the categories of areas protected by special designations. The No Action Alternative manages fewer areas with values meeting relevance and importance criteria within ACECs than alternatives I, III, IV and V. In addition, this alternative would not manage lands for their wilderness characteristics. The No Action Alternative, would manage more acres under VRM I and II classifications than Alternatives II, IV, and VI, effectively preventing more noticeable changes in the planning area's landscape.

Some of the prevention of noticeable change in the visual landscape provided by VRM I and II classifications would be provided under ACEC designation and management for Wilderness

Characteristics consequently non-market values associated with maintenance of the planning area's visual landscape could be maintained under these designations. Without further site specific analysis it is unclear as to the degree to which designations would have an effect on non-market values associated with the visual landscape they protect. However, this alternative would ensure less protection than Alternatives I, III, IV, and V for non-market values and natural amenities associated with values meeting relevance and importance criteria within ACECs and Lands with Wilderness Characteristics. Consequently, well-being associated with non-market values, and potential contributions from new residents and tourists attracted by these natural amenities, could be less than other alternatives.

Table 4-430. Protected Area Designations by Alternative

Indicator	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
VRM I and II	240,000	297,000	80,000	81,000	195,000	195,000	371,000	165,000
ACECs	89,000	97,000	0	61,000	333,000	230,000	966,000	22,000
Lands with Wilderness Characteristics	0	52,000	0	0	37,000	37,000	104,000	0
WSRs	31,000	31,000	31,000	31,000	31,000	31,000	31,000	31,000

Impacts from Management Specific to Alternatives I, III, IV, and VI (Proposed RMP)

Under Alternatives I, III, IV, and VI non-market values associated with natural amenities differ according to the categories of areas protected by special designations. Without further site specific analysis it is unclear as to the degree to which designations would have an effect on non-market values associated with the natural amenities they protect. Some of the prevention of noticeable change in the visual landscape provided by VRM I and II classifications would be provided under ACEC designation and management for Wilderness Characteristics consequently, non-market values associated with maintenance of the planning area's visual landscape could be maintained under multiple designations. Amongst these alternatives Alternative IV would ensure more protection of non-market values and natural amenities associated with values meeting relevance and importance criteria within ACECs and Alternative I would ensure more protection of non-market values and natural amenities associated with Lands with Wilderness Characteristics. Consequently, well-being associated with non-market values, and potential contributions from new residents and tourists attracted by natural amenities protected by these designations, could be more under Alternatives I and IV amongst these alternatives.

Impacts from Management Specific to Alternative II

Under Alternative II, non-market values associated with natural amenities differ according to the categories of areas protected by special designations. Alternative II would not designate any ACECs like other alternatives. In addition, this alternative does not manage Lands for Wilderness Characteristics. In addition this alternative, manages less acres under VRM I and II classifications than the other alternatives effectively allowing more noticeable changes in the planning area's landscape.

Impacts from Management Specific to Alternative V

Under Alternative V, non-market values associated with natural amenities differ according to the categories of areas protected by special designations. Alternative V manages more areas with values meeting relevance and importance criteria within ACECs than the other alternatives. In addition, this alternative manages more land for wilderness characteristics than the other alternatives and manages more acres under VRM I and II classifications than the other alternatives; effectively preventing less noticeable changes in the planning area's landscape.

Some of the prevention of noticeable change in the visual landscape provided by VRM I and II classifications would be provided under ACEC designation and management for Wilderness Characteristics consequently non-market values associated with maintenance of the planning area's visual landscape could be maintained under these designations. Without further site specific analysis it is unclear as to the degree to which designations would have an effect on non-market values associated

with the natural amenities they protect. However, this alternative would ensure more protection than the other alternatives for non-market values and natural amenities associated with values meeting relevance and importance criteria within ACECs, visual resources, and Lands with Wilderness Characteristics. Consequently, well-being associated with non-market values, and potential contributions from new residents and tourists attracted by these natural amenities, could be more than the other alternatives.

Summary of Direct and Indirect Impacts

Table 4-431 displays employment and income estimates from the model discussed above. This model uses estimated animal unit months (AUMs) at initial and full implementation under the alternatives. Impacts are displayed in two ways: as a percent relative to employment, and income under the current level of billed AUMs under the No Action Alternative and as a percent relative to current contribution to the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Increases or decreases in employment could occur relative to current conditions with willing permittees and favorable market conditions. These potential changes are depicted for the entire four-county region; however, these effects would be greater for smaller areas within the four-county region.

Table 4-431. Impacts Resulting from Estimated Animal Unit Month Levels at Initial and Full Implementation of the Plan by Alternative

Indicator	Alternative							
	No Action	I	II	III	IV		V	VI
					IV-A	IV-B		
Impacts Relative to Current Billed AUM Levels [A]								
Estimated AUMs at Initial Implementation								
Employment and Income	33%	25% to 72%	132% to 181%	81% to 128%	-38% to -2%	-36% to 0%	-69% to -38%	43% to 116%
Estimated AUMs at Full Implementation								
Employment and Income	6% to 72%	19% to 63%	140% to 192%	83% to 131%	-48% to -18%	-46% to -16%	-72% to -44%	23% to 85%
Impacts Relative to the Current Contribution to the Cattle Ranching and Farming Sector and the Sector Containing Sheep Grazing (Animal Production, except Cattle and Poultry and Eggs)[B] from Current Billed AUMs								
Estimated AUMs at Initial Implementation								
Employment	7%	6% to 16%	30% to 40%	18% to 29%	-8% to -1%	-8% to 0%	-16% to -9%	10% to 26%
Estimated AUMs at Full Implementation								
Employment	1% to 16%	4% to 14%	31% to 43%	19% to 29%	-11% to -4%	-10% to -4%	-16% to -10%	5% to 19%

[A] Percent change relative to employment or income for current Billed AUM levels (151,000 AUMs) under the No Action Alternative.
[B] Percent change relative to employment or income in the Cattle Ranching and Farming Sector and the Sector Containing Sheep Grazing (Animal Production, except Cattle and Poultry and Eggs).

Table 4-432 displays a summary of impacts to employment and income resulting from changes in recreation visitor use due to population growth and management that would affect recreation in the planning area. Impacts are displayed as a percent relative to employment and income resulting from current recreation visitor use in the planning area.

Table 4-432. Impacts Resulting from Changes in Recreation Visitor Use by Alternative

Indicator	Alternative						
	No Action	I	II	III	IV	V	VI
Employment	5% to 5%	5% to 10%	0% to 5%	5% to 10%	5% to 10%	-5% to -10%	5% to 10%
Income	5% to 5%	5% to 10%	0% to 5%	5% to 10%	5% to 10%	-5% to -10%	5% to 10%

Table 4-433 summarizes the direction of impacts to employment and income that would result from the construction and operation of wind energy projects in the planning area, if such a development were to occur under the alternatives. These impacts are intended to illustrate differences between the alternatives; it is not within the scope of this analysis to speculate on the likelihood or probability such a project would be approved or ultimately constructed.

Table 4-433. Impacts Resulting from Expected Wind Energy Development in the Planning Area by Alternative

Indicator	Alternative						
	No Action	I	II	III	IV	V	VI
Employment and Income	Increase	No Change	Increase	No Change	No Change	No Change	No Change

Positive economic impacts are associated with increases in employment or income. Negative economic impacts are associated with decreases in employment or income. The following scale is used to rate the magnitude of impacts to employment or income resulting from livestock grazing, recreation, and wind energy development:

- **Negligible economic impacts** – Changes of up to 5%,
- **Minor economic impacts** – Changes of more than 5% and up to 25%,
- **Moderate economic impacts** – Changes of more than 25% and up to 50%, and
- **Major economic impacts** – Changes of more than 50% or changes that allow for a new economic opportunity.

Impacts from the No Action Alternative

Under the No Action Alternative the economic impacts associated with livestock grazing at initial to full implementation would range from minor to major and positive relative to current billed AUM levels; these effects would be minor and positive relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible and positive relative to current recreation use levels. The opportunity for wind energy development in the southeast corner of the planning area has the potential to result in positive impacts relative to current levels of wind energy development, although these effects are contingent on development actually occurring.

Impacts from Alternative I

The economic impacts associated with livestock grazing under Alternative I at initial and full implementation of the plan would range from minor to major and positive relative to current billed AUM levels; these effects would range from negligible to minor and positive relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible to minor and positive relative to current recreation use levels. No change in impacts from

expected wind energy development is anticipated since this alternative is amongst those alternatives with the lowest amount of acreage with expected wind energy development areas; consequently development in the planning area is not anticipated to change.

Impacts from Alternative II

The economic impacts associated with livestock grazing under Alternative II at initial and full implementation of the plan would be major and positive relative to current billed AUM levels; these effects would be moderate and positive relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible and positive relative to current recreation use levels. The opportunity for wind energy development in the southeast corner of the planning area has the potential to result in positive impacts relative to current levels of wind energy development, although these effects are contingent on development actually occurring.

Impacts from Alternative III

The economic impacts associated with livestock grazing under Alternative III would range from minor to major and positive relative to current billed AUM levels at initial and full implementation of the plan; these effects would range from minor to moderate and positive relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible to minor and positive relative to current recreation use levels. No change in impacts from expected wind energy development is anticipated since this alternative is amongst those alternatives with the lowest amount of acreage with expected wind energy development areas; consequently development in the planning area is not anticipated to change.

Impacts from Alternative IV

The economic impacts associated with livestock grazing under Alternatives IV-A and IV-B would be negligible to moderate and negative relative to current billed AUM levels at initial implementation of the plan and minor to moderate and negative at full implementation of the plan; however, these effects would range from negligible to minor and negative relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible to minor and positive relative to current recreation use levels. No change in impacts from expected wind energy development is anticipated since this alternative is amongst those alternatives with the lowest amount of acreage with expected wind energy development areas; consequently development in the planning area is not anticipated to change.

Impacts from Alternative V

The economic impacts associated with livestock grazing under Alternative V would be moderate to major and negative relative to current billed AUM levels at initial implementation of the plan and moderate to major and negative at full implementation of the plan; these effects would be minor and negative relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible to minor and negative relative to current recreation use levels. No change in impacts from expected wind energy development is anticipated since this alternative is amongst those alternatives with the lowest amount of acreage with expected wind energy development areas; consequently development in the planning area is not anticipated to change.

Impacts from Alternative VI (Proposed RMP)

The economic impacts associated with livestock grazing under Alternative VI would be moderate to major and positive relative to current billed AUM levels at initial implementation of the plan and minor to major and positive at full implementation of the plan; these effects would range from minor to moderate and positive relative to current contributions from the cattle ranching and farming sector and the sector containing sheep grazing (animal production, except cattle, poultry, and eggs) from current billed AUMs. Impacts associated with recreation would be negligible to minor and negative relative to current recreation use levels. No change in impacts from expected wind energy development is anticipated since this

alternative is amongst those alternatives with the lowest amount of acreage with expected wind energy development areas; consequently development in the planning area is not anticipated to change.

Cumulative Impacts

Past, Present, and Reasonably Foreseeable Actions

The cumulative impact analysis area is the same as the analysis area for direct and indirect impacts: Elmore, Owyhee, and Twin Falls Counties, ID, and Elko County, NV.

Other actions within the analysis area that would affect employment and income include all other types of economic activities that occur within the analysis area. The effects from past social and economic activities have already been absorbed by local communities and are represented in the affected environment. Any change in the social and economic environment as a result of management would be in addition to the cumulative effect of past activities as presented in the affected environment section. In addition, cumulative effects would accrue alongside present activities occurring simultaneously in the region as well as those that could reasonably and foreseeably occur in the future. The industry sectors affected by these economic activities include those listed in Table 4-415. The 2010 baseline conditions for the total economy of the four-county region are displayed in Table 4-434.

Table 4-434. 2010 Baseline Conditions for the Total Economy of the Four-County Region

Indicator	Total Economy
Employment	88,000
Income	$3,624,000,000

In addition, growth in population and income in the four-county region and in Idaho will continue to drive demand for resources in the planning area, such as forage and minerals, as well as recreation activities, such as all-terrain vehicle (ATV) and motorcycle riding and hunting. The cumulative economic impact analysis considers the effects of these past, present, and reasonably foreseeable trends in population and income. The scope of this cumulative analysis is to consider future population growth to 2025 and across the geographic area that includes the four counties in the planning area and the State of Idaho.

Based on the forecasts shown in Table 4-435, population in Idaho will increase by 305,900 people (20%) between 2010 and 2025, while the four-county region is projected to grow 22%. This increase in population growth would increase demand for natural resources and recreation use in the planning area. Increased demand for natural resources and recreation would have positive economic impacts; however, economic impacts to particular industry sectors cannot be determined.

Table 4-435. Actual and Projected Population for the Four-County Region and the State of Idaho

County	2010	2015	2020	2025
Elmore, ID	27,038	31,700	33,400	35,000
Owyhee, ID	11,526	12,800	13,500	14,200
Twin Falls, ID	77,230	83,200	87,700	91,700
Elko, NV	48,818	54,800	57,800	60,400
Four-County Total	**164,612**	**182,500**	**192,400**	**201,300**
Idaho Total	**1,567,600**	**1,698,500**	**1,791,400**	**1,873,500**

Sources: (US Census Bureau, 2013a).

Personal income in Idaho is forecast to increase by about 4% per year between 2012 and 2016 (IDFM, 2013). Per capita personal income in Idaho was $33,768 in 2012 and is predicted to be $38,034 in 2016. One example of how income growth can affect resource and recreation use in the planning area is the purchase and use of ATVs and off-highway motorcycles. Between 2006 and 2011, 10,258 visitor days were spent participating in off-highway vehicle activities in the planning area (BLM, 2012b). ATV and motorcycle use has increased rapidly in the region, as illustrated by the growth in registrations shown in Table 4-436. Between 2004 and 2012, registrations increased by more than 40% in Elmore, Owyhee, and

Twin Falls Counties. Registrations in the State of Idaho increased even faster, by more than 50% during the period.

Table 4-436. Number of All-Terrain Vehicles and Off-Highway Motorbikes Registered by County of Residence

County	2004	2006	2008	2010	2012	% Change from 2004 to 2012
Elmore, ID	1,552	1,880	2,354	2,281	2,185	41%
Owyhee, ID	677	853	1,072	1,003	1,009	51%
Twin Falls, ID	4,118	5,289	6,373	6,408	6,307	53%
Three-County Total	**6,347**	**8,022**	**9,799**	**9,504**	**9,501**	**50%**
Idaho Total	**91,037**	**117,567**	**135,362**	**137,141**	**137,262**	**51%**

Source: (IDPR, 2008; IDPR, 2013).

Based on population and income growth forecasts for the four-county region and Idaho, demand for recreation use in the planning area is expected to increase at least in proportion to population growth in the region. The exact magnitude of this increase in demand is not known, however. For example, the increase in cross-country motorized recreation in the planning area would depend in part on the availability of other motorized recreation areas and the relative quality of motorized recreation experiences in the planning area. Similarly, demand for rangeland and forage resources in the planning area will depend in part on population growth and availability of other rangeland and forage resources. Currently, there is very little spare rangeland or forage resource capacity in the planning area. Some of the trends that would impact future demand for rangeland in the planning area include population and income growth, transition of private rangeland into residential development (which would reduce the amount of rangeland resources in the region), and increased demand for alternative uses of planning area rangeland such as mineral and energy development or recreation use that could reduce rangeland available for livestock.

With regard to wind energy development, the southeast corner of the planning area is the area with the greatest wind resource potential within the planning area. There are only a few other areas rated Fair (Class 3) or Good (Class 4), primarily in the northeast corner of the planning area; smaller-scale projects would more likely be developed on private land in this area. A mid-sized project exceeding 100 megawatt could possibly be built on private lands, but transmission facilities would likely cross public lands. Overall, the development of wind projects within the Idaho portion of the planning area would be limited given that the State of Idaho does not have a renewable portfolio standard or other incentive for alternative energy development.

With the forecast data available, it is not possible to quantify how these trends would affect employment and income for the total economy of the four-county region. However, because the contributions of the planning area to these conditions are relatively small in every alternative, it is assumed for the purpose of the cumulative impacts analysis that the conditions displayed in Table 4-434 would provide an adequate basis for estimating cumulative impacts. Qualitative analysis is also presented where appropriate.

Establishing areas to be managed for wilderness character, changes to Areas of Critical Environmental Concern (ACECs), Wild and Scenic River (WSR) eligibility and other designations such as Visual Resource Management would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands. Natural amenities and quality of life have been increasingly recognized as important factors in many rural communities in the West (Rudzitis and Johnson, 2000). Thus ACECs, WSRs, and land to be managed for wilderness character similarly contribute to area quality of life of communities interested in resource protection. The effects on quality of life from special area designations and management of these attributes on other Federal, State, and private land cannot be projected; however, similar designation has occurred on public land in the area for example, the Bruneau-Jarbidge Rivers Wilderness was designated. Similar designations in the future could be the greatest cumulatively under Alternative V and the least under Alternative II (see discussion above on the Role of

Amenities, Migration and Non-market Values under the alternatives). In addition, the protection of natural amenities and non-market values on the BLM could play an important role cumulatively if resources on other land ownerships become scarcer.

4.6.3. Environmental Justice

As discussed in the *Environmental Justice* section of Chapter 3, populations exist within the planning area that can be characterized as Environmental Justice populations. None of the management outlined in Chapter 2 would disparately impact a specific race, ethnicity or low income group. Management would affect employment and income in specific economic sectors, particularly the Agricultural, Forestry, Fishing, and Hunting Sector (see the *Economic Conditions* section); however, minority and low income employees in sectors would not be affected disparately.

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