

CHAPTER 4—ENVIRONMENTAL CONSEQUENCES

The “federal action” is the selection of an alternative plan on which future Bureau of Land Management (BLM) land use actions would be based. The purpose of this chapter is to determine the potential for significant impact of the federal action on the human environment. As defined in 40 Code of Federal Regulations (CFR) §1508.14, the “human environment” is interpreted comprehensively to include natural and physical resources and the relationship of people with those resources.

This chapter discusses the effects each alternative could have on various environmental, socioeconomic, and land use program areas (see Table 2-4 at the end of Chapter 2 for summary of impacts). Analysis of the alternatives has focused on identifying types of impacts and estimating their potential significance. The impact analysis for the No Action Alternative was prepared first as the baseline for the alternatives analysis. It contains a detailed discussion of impacts used for comparison with other alternatives. Where impacts are the same among alternatives, reference is made to those alternatives so that impacts are not repeated. However, the analysis under the Preferred Alternative does not make such references, and impacts are fully discussed.

4.1 TYPES OF IMPACTS

The terms “impact” and “effect” are synonymous. Impacts can be direct, indirect, or cumulative. A direct impact is caused by an action and occurs at the same time and place. An indirect impact occurs later in time or is farther removed in distance, but it is related to the action by a chain of cause and effect. Indirect impacts may reach beyond the natural and physical environment (i.e., environmental impact) to include growth-inducing effects and other effects related to induced changes to resource users (i.e., non-environmental impact).

An impact is defined as adverse or beneficial. An impact is considered adverse when the outcome of the action results in undesirable effects. A beneficial impact can result if the current condition is improved or if an existing undesirable effect is lessened. Although beneficial impacts were identified, the analysis focused on those impacts that were adverse in determining whether the effects were significant or insignificant. The criteria used to differentiate between significant and insignificant effects are introduced in the next section.

Adverse impacts can be mitigated through avoidance, minimization, restoration, reduction, or compensation. Mitigation measures are considered when identifying and implementing management actions and when determining and comparing impacts. Impacts may be reduced to less-than-significant levels if mitigation guidelines and standard practices are implemented. Mitigation measures may be imposed by regulation or through BLM policies and may be applied broadly or site-specifically. Standard practices and mitigation guidelines that would be implemented for particular activities are described in Appendices 5 and 6.

Cumulative impacts can result from individually minor but collectively significant actions taking place over time. The Council on Environmental Quality describes cumulative impacts as follows:

The impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person

undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative impact analysis for this Environmental Impact Statement (EIS) evaluates the potential impacts associated with the Jack Morrow Hills (JMH) alternatives, in combination with the potential impacts associated with other relevant activities that have occurred, are occurring, or may occur in the vicinity of the JMH Coordinated Activity Plan (CAP) area. The geographic scope of the JMH CAP cumulative impact analysis considers the area within and around the JMH boundary, including the Green River Resource Planning Area. A cumulative impact analysis would typically consider industrial, military, land management, and economic projects and activities. After review of available information, the following activities have been identified as having the highest likelihood of potential cumulative impacts that could collectively add to impacts from JMH alternatives:

- BLM land management plans and activities outside the JMH planning area boundary
- Regional oil and gas development activities (e.g., exploration, production, and pipeline development)
- Regional recreation activities (e.g., big game hunting, off-highway vehicle (OHV) use, dispersed recreation, etc.)
- Economic development activities in Fremont, Sublette, and Sweetwater counties
- Activities within the Green River, Sweetwater River, and Great Divide basins
- Activities affecting air resources in southwestern Wyoming, north-central Utah, and northwestern Colorado.

4.2 DETERMINATION OF SIGNIFICANCE

The concept of significance used in this chapter encompasses several factors, including the magnitude of change from existing conditions and the likelihood of the change to occur. The context and the intensity of the impact are also considered. Context relates to the environmental circumstances at the location of the impact, intensity refers to the severity or extent of an impact.

In evaluating the context of an impact, the area or quantity of an affected resource relative to the available area or quantity of that resource is considered. The potential for change in growth and reproductive success of a species, maintenance of a population at preproject levels, and the period of recovery after disturbance are other factors considered. The intensity of an impact is dependent on several factors, including the potential for violation of laws or regulations; the degree of uncertainty and controversy; the degree of adverse effect to specific concerns such as public health and safety, unique resources, or threatened and endangered species; and the resilience of the resource.

Determining significance is complex. The significance of a resource or impact is dynamic and may change during the planning period. Significance can be “real” and supportable by fact, or “perceived” and perhaps not fully supportable even with rigorous study. For this analysis, the approach for establishing significance criteria was based on legal issues, public

perception, and professional judgment. Significance criteria are introduced in the specific resource categories.

4.3 ANALYSIS METHODS

Impact analysis is a cause and effect process. Analysis methods identified resources that would be considered significant for reasons such as legality, uniqueness, availability, or resilience, and then predicted changes to these resources. The magnitude or scale of the resource change was defined, and a judgment as to the significance of that change was made.

Potential impacts of certain land use activities can be compared visually and numerically among the alternatives by using geographic information system (GIS) coverages and databases. The locations of resources and overlapping issues are shown in Maps 1–71. The approximate geographic size of these resources is listed in Table 3-1 at the end of Chapter 3, and the magnitude of the overlapping resource issues are compared among the alternatives in Tables 4-1 to 4-10 at the end of Chapter 4. These tables and maps should be reviewed in conjunction with the discussion of impacts in the following sections.

Environmental impacts associated with the management alternatives are caused by land use activities. Certain assumptions are made regarding level of land use activity, resource condition, and resource response on which to determine potential impacts. The analysis considered the following:

- Restrictions or prohibitions on activities in specific areas to protect sensitive resources
- Mitigation requirements that prevent or limit direct impacts associated with land use activities or that reclaim the land after the activity has been completed
- Standards and guidelines that assess rangeland health and provide strategies to achieve resource conditions and management objectives
- Projections of the level of activity for land uses based on historical trends, existing land use agreements such as leases or permits, and statements of interest in land use by individuals and industry organizations
- Impacts of land use activities that occur regardless of location of the land use, and impacts dependent on the location of the activity and potentially affected resources.

BLM manages public lands for multiple uses in accordance with the Federal Land Policy and Management Act (FLPMA). Land use decisions are made that protect the resources while allowing different uses of those resources, such as livestock grazing, energy development, and recreation. Where there are conflicts between resource uses, or a land use activity may result in unacceptable or irreversible impacts to the environment, BLM may restrict or prohibit some land uses in specific areas. To ensure that BLM meets its mandate of multiple-use in land management actions, the impacts of the alternatives on resource users (albeit nonenvironmental impacts) are identified and assessed as part of the planning process. The projected impacts on land use activities and the associated environmental impacts of land uses are characterized and evaluated for each management alternative in the following sections. It is important to note that all management prescriptions for each resource and resource use directly and/or indirectly relate to each other; therefore impacts of other prescriptions and guidance may apply to each resource management activity.

4.4 LAND AND WATER RESOURCES

The land and water resource management category encompasses the biological and hydrologic resources and the users and land use programs that affect those resources. The significance criteria and analysis assumptions are described within each subcategory.

4.4.1 Potential Impacts on Fire Management

The fire management program is a land use program that has both adverse and beneficial environmental impacts on resources and nonenvironmental effects to resource users. Impacts that implementation of the fire management program has to resources and resource users are discussed in those particular resource sections. This section describes potential impacts on the fire management program due to implementation of management actions of other resource management categories.

Adverse impacts on the fire management program would be considered significant if management actions or activities increased the costs related to the fire management program to the point where the overall effectiveness of the program is reduced.

It is assumed that a direct relationship exists between density of human use within the planning area and the frequency of person-caused fires and that a direct relationship exists between fuel loads (standing and nonstanding vegetation) and potential fire size and intensity. Prescribed burns would be limited throughout the planning area and planning period. The potential for land treatments through the use of prescribed fire would be limited. Some areas of dense, overmature Wyoming and mountain big sagebrush could benefit from planned ignitions. The amount of area to be treated with prescribed fire is not expected to exceed 5,000 acres for the next 20 years.

4.4.1.1 Common to All Alternatives

The management actions associated with the alternatives would primarily impact the fire management program by affecting costs associated with prescribed burns and wildfire suppression efforts. Program costs would increase from increased fire frequency and increased fire size and/or intensity. Adhering to the Fire Management Implementation Plan for BLM-Administered Public Lands and the National Fire Plan would assist in maintaining the program as planned and budgeted.

Some activities that would occur under all alternatives that affect fire frequency are OHV use, recreational activity, and mineral exploration and development. These activities introduce additional ignition sources into the planning area, which in turn increases the probability of wildfire occurrence. The activities can occur in remote areas that would affect the time and cost related to transporting fire suppression equipment to such locations. Livestock grazing can also affect fire frequency by reducing fine fuels, which decreases the probability of ignition. This could benefit the fire management program through decreased firefighting costs but could also adversely impact the opportunity for positive effects of fire.

Fire size and intensity can be affected by the fire suppression activities allowed and activities that increase or decrease fuel loading. The restrictions and limitations placed on fire suppression activities within special management areas and around heritage sites could adversely impact the ability of firefighters to protect these sites from wildfires. However,

limiting suppression activities to existing roads and trails could reduce suppression-related costs by focusing suppression efforts to existing fuel breaks.

Livestock grazing could also increase fire intensity by decreasing fire frequency. Decreasing the probability of ignition through the reductions of fine fuels could provide more time for the accumulation of larger fuel sources (e.g., shrub vegetation) between fires. When properly managed, livestock grazing activity would leave sufficient fine fuel to allow for ignition.

Excessive removal of fine fuels caused by overgrazing could lead to increased brush size and density, which could increase fire intensity. However, this is not anticipated because of the implementation of the Wyoming Standards for Healthy Rangelands and desired plant community (DPC) objectives, which would ensure that widespread overgrazing would not occur. Fine fuel reduction by grazing livestock could also adversely impact fire prescription activities by limiting the ability of an area to support prescribed fire as a management tool.

These management actions and land use activities could have an adverse impact on the fire program, but the level of significance would depend on the number of wildfires in any given year.

Factors affecting costs associated with prescribed burns include restrictions on vehicle and other equipment use, constructing control lines in areas of sensitive resources, and timing requirements for burns in sensitive watersheds. Approximately 5,000 acres of prescribed burns are proposed over the planning period. Any adverse impacts on the fire management program due to prescribed burning would be minimal because there should be adequate planning, timing, and budgeting for this level of activity.

4.4.1.2 No Action Alternative

Mineral exploration, development, and production increase the potential for wildfire occurrence through an increased number of ignition sources, which in turn increases the cost of managing fire within the planning area. It is assumed that the amount of mineral development that would occur during the planning period is related to available acreage. Therefore reducing available acreage (i.e., closing areas to mineral development) would serve to diminish development activity and subsequently reduce adverse impacts on the fire management program.

Recreational activities such as camping and OHV use have the potential to increase fire frequency by increasing the number of ignition sources (e.g., campfires and catalytic converters). Furthermore the remote areas in which these activities often occur can increase costs related to transporting fire suppression equipment. Under this alternative, camping would be allowed throughout the planning area (except where necessary to protect water quality and wildlife), which could increase fire management costs by increasing fire activity over a larger area. Limiting OHV use to designated and existing roads and trails could minimize the number of fires ignited by these vehicles. The level of significance of these activities on the fire management program would be dependent on the number of human-caused fires in any given year.

Impacts of management actions for wild horses on the fire management program would be similar to those resulting from livestock grazing, but on smaller scale and over a smaller area. Management of wild horses could serve to reduce fine fuels through foraging and thereby reduce the probability of ignition. This could also increase fire intensity by providing more

time for the accumulation of larger fuel sources (e.g., shrub vegetation) between fires. Excessive removal of fine fuels could lead to increased brush size and density, which could increase fire intensity. However, this is not anticipated because of the implementation of healthy rangeland standards and DPC objectives, which would ensure that widespread overuse would not occur.

Vegetation management actions could have both beneficial and adverse impacts on the fire management program. Beneficial impacts could result from reducing fire size and/or intensity through maintaining healthy and diverse vegetation communities. Highly diverse vegetation communities promote mosaic vegetation patterns that slow the spread of fires. Beneficial impacts would also be realized by applying full fire suppression in basin big sagebrush/lemon scurfpea vegetation associations, which would help to reduce fire size and/or intensity. Negative impacts could include increased costs related to prescribed burn stipulations (e.g., spring burning) and fire suppression restrictions within certain sensitive vegetation resources (e.g., vehicular suppression activities limited to existing roads and trails within special status plant species habitat). Using prescribed burns as a vegetative treatment would be planned in advance and thus should not significantly impact the fire management program.

Cumulative Impacts. Increased development activities and recreation may increase the potential for human-caused wildfires, including fires occurring within or adjacent to developed sites. Oil, gas, and other developments (e.g., power lines and pipelines) diminish opportunities to use fire as a treatment tool to rejuvenate decadent plant communities, because of safety concerns. With increased development and attendant infrastructure (power lines, compressors, pipelines, fuel tanks, etc) comes a corresponding increase in the potential for fire suppression to occur within the Wildland-Urban Interface (WUI). Suppression activities within WUI areas can be more dangerous, time-consuming and expensive. Particularly critical would be the extra caution required for firefighter safety within an active gas field. Cost can be increased substantially because of the increased value of developed sites compared to undeveloped rangeland. Cumulative impacts on fire management are expected to be minimal.

4.4.1.3 Alternative 1

Impacts on the fire management program from implementing management actions for wild horses and vegetation would be similar to those of the No Action Alternative.

Although camping activities are anticipated to be similar to those of the No Action Alternative, increased OHV use would be expected throughout the planning area because of more available areas in which to travel. The potential for increasing fire frequency and increasing the cost of fire suppression because of these recreational activities would depend on of the number of human-caused fires in any given year.

This alternative provides the greatest opportunity for mineral development and production, which could affect fire management. More of the planning area would be open to all types of mineral exploration and development, which could increase the potential for human-caused fires through an increased number of ignition sources. Conversely, the increased and/or improved access and construction of fuel breaks due to increased mineral activities could improve suppression opportunities and effectiveness. The level of significance of these impacts would be dependent on the fire frequency in any given year.

Under this alternative, the anticipated use of livestock animal unit months (AUM) would increase over the planning period to the permitted active use amount, which is approximately double the historic use. This would increase the impacts associated with livestock grazing on the fire management program.

Activities related to special management areas under this alternative could reduce localized effects to fire management. Removing the Area of Critical Environmental Concern (ACEC) designation from Steamboat Mountain and reducing the viewshed of the National Historic Trail Special Recreation Management Area through South Pass would eliminate specific management actions associated with these areas, which would in turn reduce the amount of area subject to fire suppression-related limitations and restrictions.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts would be greatest under this alternative because of anticipated increases in development activities and access. Cumulative impacts on fire management, although greatest for this alternative, are expected to be minimal.

4.4.1.4 Alternative 2

Impacts on the fire management program from implementing management actions for vegetation would be the same as those of the No Action Alternative.

The Divide Basin Wild Horse Herd Management Area (HMA) would be reduced to exclude the planning area. This would remove wild horses from the planning area that were otherwise impacting the fire management program by reducing fine fuels.

Recreation management activities could have less of an impact on fire management than under the No Action Alternative. Camping would be allowed only in designated areas, and parties of five or more would require a group camping permit. Such restrictions would concentrate camping activities, thereby controlling the areas that could be adversely impacted by escaped campfires or other accidental ignitions. A large portion of the planning area would be closed or limited to OHV use. This would likely decrease fire frequency caused by human activity and have an overall beneficial effect to the fire management program.

This alternative provides the least opportunity for mineral development and production, which would result in reduced adverse impacts to fire management as compared to all other alternatives. More areas would be closed to all types of mineral development, which would decrease the potential for wildfire occurrence by reducing the number of ignitions sources.

Activities related to special management areas could result in greater impacts on the fire management program than under the other alternatives. Management actions associated with the expansion of existing ACECs and historic viewsheds, and management of new ACECs and Wilderness Study Areas (WSAs), could increase the amount of area subject to fire suppression-related limitations and restrictions. This could reduce the ability of firefighters to protect these sites from wildfires. However, limiting suppression activities to existing roads and trails could reduce suppression-related costs by focusing suppression efforts to existing fuel breaks. The level of significance would depend on the number of wildfires occurring in these special management areas in any given year.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except restrictions on development and access would further reduce the

potential for human-caused wildfires and wildland-urban interface situations, minimizing cumulative impacts on fire management. However, limitations placed on vehicle use and fire suppression activities could add to suppression costs.

4.4.1.5 Alternative 3

Impacts on the fire management program from implementing management actions for vegetation would be the same as those of the No Action Alternative.

Recreation management activities could have less of an impact on fire management than under the No Action Alternative. Camping would only be allowed in designated areas, and parties of 10 or more would require a group camping permit. Such restrictions would concentrate camping activities, thereby controlling the areas that could be impacted by escaped campfires or other accidental ignitions. Additional portions of the planning area would be closed or limited to OHV use. This would likely decrease fire frequency caused by human activity, and consequently the cost of managing fire within the planning area.

Impacts on the fire management program from mineral development would be similar to those of the No Action Alternative. The amount of area closed to mineral development would be far less than under Alternative 2 and considerably more than Alternative 1. Therefore adverse impacts would be anticipated (increased fire frequency caused by an increase in ignition sources), but comparable to the other alternatives.

Expanding the Divide Basin Wild Horse HMA to include the entire planning area could potentially increase the beneficial and/or adverse effects associated with wild horses (reduction of fine fuels via foraging) on the fire management program by allowing wild horses to graze more areas. However, this additional impact would not be significant, as the number of horses allowed in the expansion area would be limited.

Impacts related to special management areas would be similar to those of Alternative 2 but not as intense because of less area managed with fire suppression-related limitations and restrictions. Fewer expansions and management prescriptions for special management areas under this alternative would result in fewer management actions that place limitations and restrictions on fire suppression activities.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except restrictions on development and access would further reduce the potential for human-caused wildfires and wildland-urban interface situations, minimizing cumulative impacts on fire management. However, limitations placed on vehicle use and fire suppression activities could add to suppression costs. Cumulative impacts would be greater than under Alternative 2 because of fewer restrictions on development and access.

4.4.1.6 Preferred Alternative

The management actions associated with the alternatives would impact the fire management program primarily by affecting costs associated with prescribed burns and wildfire suppression efforts. Program costs would increase because of increased fire frequency and increased fire size and/or intensity. Adhering to the Fire Management Implementation Plan for BLM-Administered Public Lands and the National Fire Plan would assist in maintaining the program as planned and budgeted.

Management of heritage resources could adversely impact fire management by placing restrictions on fire suppression activities. Protections afforded to heritage resources and surrounding areas include fire suppression-related limitations and restrictions, which could impact the ability of firefighters to protect these sites from wildfires. However, limiting suppression activities to existing roads and trails could reduce suppression-related costs by focusing these efforts to existing fuel breaks. The level of significance would depend on the number of wildfires occurring in these areas in any given year.

Prescribed burning could adversely impact the fire management program through increased costs. Factors may include restrictions on vehicle and other equipment use, constructing control lines in areas of sensitive resources, and timing requirements for burns in sensitive watersheds. Approximately 5,000 acres of prescribed burns are proposed over the planning period. Any adverse impacts on the fire management program due to prescribed burning would be minimal, as there should be adequate planning, timing, and budgeting for this type and level of activity.

Mineral exploration, development, and production increase the potential for wildfire occurrence through an increased number of ignition sources, which in turn increases the cost of managing fire within the planning area. It is assumed that the amount of mineral development that would occur during the planning period is related to available acreage. Therefore reducing available acreage (i.e., closing areas to mineral development) would serve to diminish development activity and subsequently reduce adverse impacts on the fire management program. The adaptive management strategy under this alternative would initially preclude some development from occurring, potentially resulting in less impact than under the No Action Alternative. However, because of the uncertainty of the outcome of this adaptive management strategy, the level of long-term impact is not known. Significance level would depend on the amount of area ultimately developed over the planning period and the number of human-caused fires in any given year.

Recreational activities such as camping and OHV use have the potential to increase fire frequency by increasing the number of ignition sources (e.g., campfires and catalytic converters). Furthermore the remote areas in which these activities often occur can increase costs related to transporting fire suppression equipment. Under this alternative, camping would be allowed throughout the planning area (except where necessary to protect water quality and wildlife), which could increase fire management costs by increasing fire activity over a larger area. Placing limitations on OHV use and closing certain areas to such use could minimize the number of fires ignited by these vehicles. The level of significance of these activities on the fire management program would be dependent on the number of human-caused fires in any given year.

Livestock grazing can affect fire frequency by reducing fine fuels, which decreases the probability of ignition. This could benefit the fire management program through decreased firefighting costs but could also adversely impact the opportunity for positive effects of fire. Livestock grazing could also increase fire intensity by decreasing fire frequency. Decreasing the probability of ignition through reductions of fine fuels could provide more time for the accumulation of larger fuel sources (e.g., shrub vegetation) between fires. When properly managed, livestock grazing activity would leave sufficient fine fuel to allow for ignition. Excessive removal of fine fuels caused by overgrazing could lead to increased brush size and density, which could increase fire intensity. However, this is not anticipated because of the implementation of healthy rangeland standards and DPC objectives, which would ensure that widespread overgrazing would not occur. Fine fuel reduction by foraging livestock could

also adversely impact fire prescription activities by limiting the ability of an area to support prescribed fire as a management tool.

Impacts of management actions for wild horses on the fire management program would be similar to those resulting from livestock grazing, but on smaller scale and over a smaller area. Management of wild horses could serve to reduce fine fuels through foraging and thereby reduce the probability of ignition. This could also increase fire intensity by providing more time for the accumulation of larger fuel sources (e.g., shrub vegetation) between fires. Excessive removal of fine fuels could lead to increased brush size and density, which could increase fire intensity. However, this is not anticipated because of the implementation of healthy rangeland standards and DPC objectives, which would ensure that widespread overuse would not occur.

Vegetation management actions could have both beneficial and adverse impacts on the fire management program. Beneficial impacts could result from reducing fire size and/or intensity through maintaining healthy and diverse vegetation communities. Highly diverse vegetation communities promote mosaic vegetation patterns that slow the spread of fires. Beneficial impacts would also be realized by applying full fire suppression in basin big sagebrush/lemon scurfpea vegetation associations, which would help to reduce fire size and/or intensity. Negative impacts could include increased costs related to prescribed burn stipulations (e.g., spring burning) and fire suppression restrictions within certain sensitive vegetation resources (e.g., vehicular suppression activities limited to existing roads and trails within special status plant species habitat). Using prescribed burns as a vegetative treatment would be planned in advance and thus should not significantly impact the fire management program.

Activities related to special management areas could result in greater adverse impacts on the fire management program than under the No Action Alternative. The management prescriptions for special management areas could increase the amount of area subject to fire suppression-related limitations and restrictions, which could impact the ability of firefighters to protect these sites from wildfires. However limiting suppression activities to existing roads and trails could reduce suppression-related costs by focusing these efforts to existing fuel breaks. The level of significance would depend on the number of wildfires occurring in these special management areas in any given year.

Cumulative Impacts. Increased development activities and recreation may increase the potential for human-caused wildfires, including fires occurring within or adjacent to developed sites. Oil, gas, and other developments (e.g., power lines and pipelines) diminish opportunities to use fire as a treatment tool to rejuvenate decadent plant communities, due to safety concerns. With increased development and attendant infrastructure (power lines, compressors, pipelines, fuel tanks, etc.) comes a corresponding increase in the potential for fire suppression to occur within the WUI. Suppression activities within WUI areas can be more dangerous, time-consuming, and expensive. Particularly critical would be the extra caution required for firefighter safety within an active gas field. Cost can be increased substantially because of the increased value of developed sites compared to undeveloped rangeland. Further increases in cost could result from limitations placed on vehicle use and fire suppression activities. Cumulative impacts would be less extensive than under the No Action Alternative because of restrictions on development and access that would further reduce the potential for human-caused wildfires and wildland-urban interface situations.

4.4.2 Potential Impacts on Water Resources

Water resources include surface and subsurface water resources and the quality of each. Resources include perennial, intermittent, and ephemeral waterways; riparian areas adjacent to these waterways; wetlands; floodplains; recharge areas; and ground water. The impacts that implementation of water resource management actions have on other resources and resource users are discussed in those particular resource sections. This section describes potential impacts on water resources due to the implementation of management actions for other resource management categories.

Adverse impacts on water resources would be considered potentially significant as a result of human activities if proper functioning condition (PFC) could not be attained or maintained as a minimum physical state. Actions that accelerate erosion and runoff and alter the physical characteristic or degrade water quality beyond the designated use of the receiving stream (Table 3-5) would be a significant impact. Any loss of wetlands or wetland function, or violation of the requirements of Section 404 permits, would also be considered a significant impact.

Analysis of impacts on water resources is based on achieving the watershed objectives of stabilizing and conserving soil; increasing vegetative production; maintaining or improving surface and ground water quality; and protecting, maintaining or improving wetlands, floodplains, and riparian areas.

It is assumed that any substantial disturbance to the soils or changes in vegetative cover has an adverse effect on watershed health and water quality. The degree of impact attributed to any one disturbance or series of disturbances is influenced by location within the watershed, time and degree of disturbance, existing vegetation, and precipitation. Surface disturbances result in accelerated erosion and runoff, increasing sediment and nutrient loads to local channels.

4.4.2.1 Common to All Alternatives

Riparian areas would be managed to attain PFC as the minimum acceptable level of ecological condition. This would have a beneficial impact on watershed resources and water quality by helping to stabilize stream banks, reduce erosion and sediment yield, promote vegetative cover, and enhance water quality. Watershed assessments, increased monitoring efforts, and implementation of mitigation measures would improve watersheds with sensitive baseline conditions, having a long-term beneficial impact to the resource. Aquatic, wetland, and riparian habitat would not be disposed unless exchanged for lands with equal or greater value (including monetary and functional resource values).

BLM would continue to participate with federal, state, and local government agencies and the Colorado River Salinity Control Forum to develop and implement salinity control plans for the basin and to maintain existing and future applicable water quality plans.

Management of heritage resources would have an insignificant impact on watershed health and water quality. Management actions generally focus on the protection or preservation of heritage sites, which would in turn benefit water resources by limiting or excluding surface disturbing activities on or near such sites. Data recovery excavations could adversely affect watershed resources via surface disturbances and vegetation removal if not properly conducted. Indirect effects could occur when avoidance of cultural sites directs activities to

other areas, possibly concentrating uses and increasing adverse impacts on local watersheds. However, because of the limited activity allowed in proximity to water resources, any adverse impacts would be insignificant. Moreover, protection measures afforded by the National Historic Preservation Act would further mitigate any potential adverse impacts.

Fire could have both beneficial and adverse impacts on water resources. Beneficial and adverse impacts could be either short-term or long-term (depending on fire size and type). Adverse impacts could include increased runoff from exposed soils and sedimentation of surface waters. Wildfires usually have more adverse impacts than prescribed burns because wildfires generally cover larger areas and remove more vegetation, and if burning outside established prescription, often burn with enough heat to adversely affect soil organisms as well as kill the root system of some plants. This could result in long-term adverse impacts by compromising future plant rejuvenation and growth rates. Fire suppression activities could cause increased soil erosion from fire line construction and heavy equipment transport. The significance of any impact would depend on the amount of area burned, fire type, proximity to a water source, amount of sedimentation, and rate of revegetation. Prescribed fire burning within prescription areas would generally have a beneficial effect on watershed health by increasing age and species diversity of plant communities, promoting thicker vegetation growth which could slow erosion rates, and enhancing nutrient cycling. These effects are generally long-term.

Livestock grazing could have localized adverse impacts on watershed resources and water quality. Soil compaction and loss of vegetative cover could result in reduced infiltration and increased runoff and sedimentation of surface waters. Other potential adverse impacts from livestock grazing activities could include channel destabilization, nutrient loading of surface waters, and promotion of invasive plant species. Implementation of healthy rangeland standards, guidelines for livestock grazing, and DPC objectives would help ensure proper management of livestock resources and serve to minimize adverse impacts on watershed resources and water quality.

Livestock water developments and range improvements would be designed to improve resource conditions and livestock distribution. They generally distribute livestock within the pasture/allotment in an effort to prevent livestock concentration and overuse of forage. The immediate area surrounding range improvements would generally be adversely affected because of construction disturbances (particularly for water developments) and livestock concentrations around water developments. This would accelerate runoff and erosion within the affected area and could adversely impact nearby surface waters by increasing sediment loads. With proper planning and effective management of range improvements, any adverse impacts on water resources would be minimized to acceptable levels.

Surface disturbing activities, such as those associated with the construction of linear rights-of-way (ROW) for pipelines, transmission lines, and communication lines; and oil and gas development including construction of well pads, mud pits, and roads, could impact water resources. Land clearing and grading activities necessary for construction remove vegetation and compact soils, which contributes to increased erosion and subsequent sedimentation of local surface waters. Implementation of standard practices and mitigation measures would help minimize long-term adverse impacts on water resources by stabilizing soil conditions and promoting revegetation of disturbed areas. Disturbed sites would be monitored for effective reclamation, and linear ROWs would avoid or be excluded from sensitive areas whenever possible. If sensitive areas could not be avoided, appropriate mitigation measures would be applied.

Ground water could be affected during construction of drill pads or from other exploration and development activities. Improper casing and cementing of wells, undetected spills, or leachate from produced water or mud pits could potentially introduce contaminants to the ground water. Chemicals used for production drilling could cause local contamination of soils and ground water if not managed properly. Construction of drilling pads, proper disposal practices, proper casing and cementing, and recycling of drilling fluids would be in accordance with BLM guidelines and should minimize adverse effects to ground water quality. Hydrological investigations would be conducted prior to coalbed methane development to determine whether any connection exists between surface waters and the aquifer that would be dewatered. Appropriate measures would be taken to prevent adverse impacts on water quality during dewatering. Dewatering during coalbed methane production could reduce the quantity of ground water contained within affected aquifers because of the requirement to reinject produced water into different aquifers of equal or lower water quality. In addition, accidental discharges of produced water onto the ground surface could adversely impact any nearby surface water quality. The extent of any impact would depend on the quality of the ground water being discharged. Impacts would generally be greater if the produced water is highly saline.

Recreational activities that occur in proximity to water sources could impact watershed resources and water quality. Camping and hiking adjacent to waterways could cause localized compaction of soils, reduction of vegetation, and bank instability, which in turn could increase sediment, salt, and nutrient loads from increased runoff. Waste products from recreational activities near riparian areas could have a localized adverse effect on aquatic resources. The use of OHVs could have an adverse impact on water resources, especially if used in an unauthorized manner. Such impacts could include erosion, soil compaction, and increased turbidity from unauthorized stream crossings and use of wetland meadows. Designation of roads and trails available for OHV use and visitor compliance with BLM's OHV designations would help prevent degradation of sensitive watersheds. In addition implementation of OHV designations and educational programs such as "Tread Lightly" would further help to reduce adverse impacts on land and water sources.

Vegetation management activities would most likely result in beneficial impacts on watershed resources and water quality. The protective measures afforded to special status plant species and management actions to achieve DPC objectives would have a beneficial effect on watershed resources by maintaining plant diversity and preserving ecological conditions. Preventing and controlling the spread of invasive plant species would also improve watershed health by reducing competition with native plants and maintaining overall biodiversity. Vegetation manipulation to enhance wildlife habitat would cause adverse, short-term impacts on watershed resources by removing vegetation and subsequently increasing erosion and sedimentation; however long-term beneficial impacts could be realized by increasing age and species diversity of plants, promoting thicker vegetative growth to slow erosion, and enhancing nutrient cycling.

Long-term beneficial impacts on water resources are anticipated from wildlife habitat management activities. Actions to improve wildlife habitat generally involve the protection of water sources and the promotion of diverse plant communities which are better able to slow and filter overland flow, reduce erosive forces, and improve water quality. Short-term adverse impacts could occur where wildlife populations concentrate near water sources, potentially increasing erosion and sediment loads.

Management actions for special management areas could benefit water resources. Restrictions on development and other surface disturbing activities would help maintain or improve water sources and prevent accelerated erosion and sedimentation of surface waters from occurring.

4.4.2.2 No Action Alternative

Impacts on water resources from implementing actions for managing heritage resources, vegetation, wildlife, and special management areas would be the same as the impacts common to all alternatives.

Prescribed burns and wildfire suppression activities would have both short-term and long-term impacts on water resources, as described above in Impacts Common to All Alternatives. The minimal amount of proposed prescribed burns (approximately 5,000 acres) and the requirements for these activities (e.g., post-treatment rest, mosaic patterns, and limiting suppression activities to existing roads and trails) would minimize adverse impacts by limiting the amount of exposed ground susceptible to erosion. Full fire suppression would be applied to basin big sagebrush/lemon scurfpea vegetation associations. This vegetation association helps stabilize the sand dunes and maintains the integrity and stability of the watershed in which it grows.

Livestock grazing activities could impact water resources as described for the actions common to all alternatives. Implementation of healthy rangeland standards and guidelines for livestock grazing would ensure that adverse impacts would not be significant. Enclosures and water developments would be constructed as needed to keep livestock out of sensitive riparian areas. Such actions would most likely have a beneficial impact on watershed health and water quality. Prohibiting placement of salt and mineral supplements within 500 feet of riparian areas would minimize soil compaction and subsequent runoff near surface waters.

Surface disturbing activities such as those associated with development and ROWs could cause similar impacts common to all alternatives. Actions that limit the extent of surface disturbing activities generally minimize impacts on surface water sources and recharge areas. Surface disturbance would be controlled within 500 feet of riparian areas, wetlands, and 100-year floodplains. Permanent facilities (other than linear facilities) would not be allowed in 100-year floodplains, or riparian or wetland areas, and linear ROWs would be identified and collocated as practicable. Controlled use means that surface disturbing activities would avoid these areas unless a site-specific analysis determines that no adverse impacts would occur on water resources. These limitations would ensure that any adverse impacts on water resources would not be significant. Some surface disturbing activities may serve to maintain or improve water quality (e.g., reconstruction of crossing, road surfacing, gabions, etc.).

It is assumed that the amount of mineral development that would occur during the planning period would be related to available acreage. Therefore reducing available acreage (i.e., closing areas to mineral exploration and development) would serve to diminish surface disturbance and subsequently reduce impacts on watershed resources and water quality.

Recreational activities are not anticipated to have significant impacts. Although camping would be allowed within riparian corridors, areas would be closed if resource damage occurs, thereby preventing impacts from becoming significant. Similarly, OHV use designations would help prevent significant impacts from occurring.

Reducing and then maintaining the Appropriate Management Level (AML) for wild horses within the Divide Basin Wild Horse HMA would serve to maintain or improve watershed resources. Some trampling of riparian vegetation and subsequent erosion could occur, but could be held to an acceptable level if the selective gathering program is successful in reducing and maintaining wild horse population levels. Concentration of wild horses near water sources could increase localized erosion and sediment loads caused by trampling and overgrazing of riparian vegetation. Construction of water developments to better distribute the horse herds would help minimize this effect.

Cumulative Impacts. The potential level of cumulative impact to watershed resources is directly related to the amount, timing, and location of the disturbance in relation to vegetation, soils, and established watercourses. Increased sedimentation could result from any activity that disturbs vegetation, causes soil compaction, or channels overland flows, such as road and well pad construction, livestock trampling, and recreational use (especially OHV activity). Concomitant with loss of vegetative cover and soil loss is increased runoff from denuded surfaces which could destabilize drainages. Appropriate mitigation and project design during site-specific analysis could minimize off-site sedimentation but would be dependent on design and maintenance.

Effects to ground water resources would be dependent on the level of activity and quality and maintenance of wells. Improper casing and cementing of wells, undetected spills, or leachate from produced water or mud pits could potentially introduce contaminants to the ground water. The cumulative impact on ground water aquifers from coalbed methane development cannot be determined because of lack of information. Prior to development, investigation of aquifers and their possible connections to surface waters would provide the information necessary for determining cumulative impacts and any necessary mitigation. Containment and reinjection of produced waters that are not suitable and claimed for surface use would reduce the potential for surface water contamination and accelerated erosion in ephemeral channels.

Under this alternative, the overall disturbance would be lower in the core and higher in the surrounding areas. The higher levels of activity outside the core area, combined with increased OHV use, could create areas of concentrated disturbance that would increase the potential for surface water degradation.

4.4.2.3 Alternative 1

Impacts resulting from management of heritage resources and special management areas would be the same as impacts common to all alternatives. Implementing management actions for fire, recreation, and wild horses would have impacts on water resources the same as those of the No Action Alternative.

Livestock grazing management could likely have greater impacts on water resources under this alternative than the No Action Alternative. The anticipated use of AUMs would increase over the planning period to the fully permitted active use amount, which is approximately double the historic use. This could put greater pressure on watershed resources, potentially causing increased erosion, sedimentation, and bank instability. These additional impacts would be realized only on allotments that are not currently close to using their fully permitted AUMs. Salt and mineral supplements could be placed within 250 feet of water resources, having a greater potential of subjecting surface waters to increased sediment loads. Livestock water developments would be permitted wherever they enhance livestock production, as

opposed to enhancing livestock distribution as in the No Action Alternative. This could increase localized erosion and sedimentation of surface waters, possibly resulting in significant impacts. Existing riparian exclosures could be removed under this alternative and the area made available to livestock grazing, consequently increasing grazing pressures along riparian corridors. This could result in degradation to these riparian areas depending on current livestock management. Implementation of the Wyoming Standards for Healthy Rangelands and Guidelines for Livestock Grazing would assist in minimizing adverse impacts.

The least amount of protection would be provided to riparian areas and floodplains from surface disturbing activities under this alternative, which could cause an increase in related impacts. The amount of land area requiring controlled surface use would be reduced. Specifically, the avoidance area surrounding riparian areas and 100-year floodplains would be reduced to 250 feet, allowing surface disturbing activities to occur closer to water resources. Similarly the avoidance area for intermittent and large ephemeral drainages would be reduced to 50 feet. New permanent facilities would be allowed in floodplains, wetlands, and riparian areas provided no practicable alternatives are available to place the facility elsewhere, and that appropriate mitigation measures would be implemented. The level of significance of impacts would depend on whether the buffer zones would be large enough to adequately attenuate impacts related to surface disturbing activities.

Additional land area would be open for linear ROWs, which could allow increased construction activities to occur within sensitive watersheds. This could cause further degradation of watershed resources and water quality, and depending on where and to what degree the ROW activities would occur, impacts could be significant.

It is assumed that the amount of mineral exploration and development that would occur during the planning period would be related to available acreage. The land area available for lease and mining claims would be greatest under this alternative, thus the potential for mineral development would likely increase. This could result in greater surface disturbance and related adverse impacts on water resources because of increased potential for exposed soils, erosion, runoff, stream sedimentation, and salt and nutrient loading. The level of significance would depend on the rate and location of development activities and the rate and effectiveness of reclamation.

Benefits to watershed resources from wildlife management actions may not be quite as extensive as compared to other alternatives because of less emphasis and fewer restrictive actions to improve wildlife habitat.

Management activities related to special management areas under this alternative could reduce opportunities to maintain or improve water resources. Removing the ACEC designation from Steamboat Mountain and reducing the viewshed of the National Historic Trail Special Recreation Management Area through South Pass would eliminate specific management actions associated with these areas, which would in turn reduce the amount of area subject to surface disturbance restrictions and limitations, potentially reducing benefits to water resources.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts would be greatest because of anticipated increases in development, livestock grazing, and other surface disturbing activities, as well as fewer restrictions on such activity.

4.4.2.4 Alternative 2

Impacts resulting from vegetation management would be the same as those of the No Action Alternative.

Increased protection would be afforded to heritage resources under this alternative, which could reduce adverse impacts on watershed resources and water quality as compared to other alternatives. Buffer zones around most sites eligible for inclusion in the National Register of Historic Places (NRHP) would be increased to 300 feet. Because surface disturbing activities are prohibited within these buffers, adverse impacts on water resources could be reduced as a result of reduced erosion and sedimentation.

The fire management program would have similar impacts on water resources as under the No Action Alternative, except limited fire suppression would be applied to the basin big sagebrush/lemon scurfpea vegetation associations, as opposed to full suppression. Given the inherent disruptive nature of fire suppression efforts, this alternative could cause less erosion and less subsequent sedimentation of surface waters. However, the vegetation association stabilizes the sand dunes, and any exposure and instability of the sand caused by fire could have adverse impacts on the watershed.

Livestock grazing management would most likely have fewer impacts on water resources than under the other alternatives. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would be similar to historic levels. Salt and mineral supplements would not be allowed within one-half mile of riparian resources, thereby further reducing related impacts. Whether this greater distance from a riparian area provides any further protection than some shorter distance could depend on the topography, drainage patterns, and vegetative cover at a particular location. Within sensitive wildlife habitat, livestock water developments would be allowed only if resource conditions were improved. This potentially could benefit water resources through improved planning of such developments. Enclosures would be maintained and new ones constructed as needed to keep livestock out of sensitive riparian areas. This would maintain or improve riparian corridors.

This alternative would provide the most protection to water resources from surface disturbing activities as compared to other alternatives, primarily because a greater amount of land area would be subject to no surface occupancy requirements or ROW exclusion. Any actions that limit the extent of surface disturbing activities would help minimize adverse impacts on surface water sources and recharge areas. Surface disturbance would be controlled within one-quarter mile of riparian areas, wetlands, and 100-year floodplains. Permanent facilities would not be allowed in 100-year floodplains, riparian areas or wetlands, and linear ROWs would be identified and collocated as practicable. This larger avoidance area surrounding riparian areas and floodplains could provide considerably more protection to water resources. The increased distance may not be necessary in certain locations or for particular activities, because the likelihood of an adverse impact would be dependent on the size and type of the activity and on topography and drainage patterns of the activity location. Opportunities to construct structures that could enhance watershed resources (e.g., gabions, fences) would be reduced in this alternative. The ecological integrity of the dunal ponds (flockets) would be protected through site-specific management actions, having a beneficial effect on this unique water resource.

It is assumed that the amount of exploration and development that would occur during the planning period would be related to available acreage. The land area available for lease and

mining claims would be the most restrictive under this alternative, thus the potential for mineral development would likely decrease. Withdrawing areas from mineral development reduces the degree to which surface disturbance could occur, which in turn reduces adverse impacts to watershed resources and water quality.

Recreation management activities would have less of an adverse impact on watershed resources and water quality under this alternative than under all other alternatives. Camping would only be allowed in designated areas, and parties of five or more would require a group camping permit. Such restrictions would limit camping along streams and within sensitive areas, reducing related impacts to water resources. The amount of area closed to OHV use would increase and thus reduce the potential for accelerated erosion and sedimentation related to OHV use.

Adverse impacts from wild horse management actions could occur to the portion of the Divide Basin Wild Horse HMA located outside the planning area. Under this alternative, the HMA would be reduced, modified to exclude the planning area while maintaining the AML of horses. Although this would benefit water resources within the planning area, indirect adverse impacts could occur in the remainder of the HMA because of the concentration of approximately the same number of wild horses within a smaller area.

Benefits to watershed resources from wildlife management activities would most likely increase under this alternative because of expanded protection and habitat enhancement for wildlife resources.

Management actions related to special management areas could have a greater beneficial effect on water resources under this alternative. Management actions associated with expansion of existing ACECs and historic viewsheds, and designation of new ACECs and WSAs, would increase the amount of area subject to surface disturbance restrictions and limitations, and thus limit potential adverse impacts resulting from exposed soils and subsequent erosion and runoff into water sources.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts would be least extensive because of limitations put on development, livestock grazing, and other surface disturbing activities. The higher levels of activity outside restricted areas, combined with increased OHV use, could create areas of concentrated disturbance that could increase the potential for surface water degradation.

4.4.2.5 Alternative 3

Impacts resulting from the management of the fire program and vegetation resources would be the same as those of the No Action Alternative.

Protection would be afforded to heritage resources under this alternative, which could result in reduced adverse impacts on watershed resources and water quality, but not to the extent of Alternative 2. Surface disturbing activities would be limited within an area of 100 feet of most sites eligible for inclusion in the NRHP, thus adverse impacts on water resources may be lessened as a result of reduced erosion and sedimentation. The extent of any impact would depend on the location of the site and proximity to a water source.

Livestock grazing activities could have adverse impacts on water resources similar to those of the No Action Alternative. Although livestock operators could increase AUM use to the fully

permitted amount, anticipated use of AUMs would be similar to historic levels. Implementation of healthy rangeland standards and guidelines for livestock grazing would ensure that adverse impacts on water resources from grazing practices would not be significant. Enclosures and water developments would be constructed as needed to keep livestock out of sensitive riparian areas, having a beneficial impact to watershed health and water quality. Prohibiting placement of salt and mineral supplements within one-quarter-mile of riparian areas would minimize soil compaction that promotes runoff and sedimentation of surface waters. Topography, drainage patterns, and amount of vegetative cover at a particular salt block location could determine whether the distance of one-quarter-mile from riparian areas would be adequate or excessive to prevent adverse impacts.

This alternative would provide more protection to water resources from surface disturbing activities than the No Action Alternative and Alternative 1, primarily because a greater amount of land area would be subject to controlled surface use requirements, ROW exclusion areas, or management under a transportation plan. Any actions that limit the extent of surface disturbing activities would help minimize adverse impacts on surface water sources and recharge areas. Defining the boundaries of ground water recharge areas within the JMH planning area would ensure that appropriate measures would be taken in these locations to protect ground water quantity and quality. Surface disturbance would be controlled within 500 feet to one-quarter mile of riparian areas, wetlands, and 100-year floodplains, but these parameters could vary on a case-by-case basis. Permanent facilities would not be constructed in 100-year floodplains, and linear ROWs would be identified and collocated as practicable.

It is assumed that the amount of mineral development that could occur during the planning period would be related to available acreage. Therefore reducing available acreage (i.e., closing areas to mineral exploration and development) would serve to diminish surface disturbance and subsequently reduce adverse impacts on watershed resources and water quality. Impacts on water resources from mineral development would be similar to impacts described in the No Action Alternative. Although adverse impacts (exposed soils, erosion, and sedimentation) are anticipated in localized areas, the health of watersheds would be one indicator that determines when to limit further development to ensure adverse impacts remain insignificant.

Recreational activities would likely have similar but potentially more extensive impacts on water resources than Alternative 2. This is because measures designed to limit adverse impacts would not be as restrictive. Dispersed camping would be allowed only in designated areas, and parties of 10 or more would require a group camping permit. Such restrictions would limit camping along streams and within sensitive areas, reducing related impacts to water resources. The amount of area closed to OHV use or limited to existing roads and trails would be less than Alternative 2, which could increase the potential for soil exposure, accelerated erosion, and increased sedimentation of water sources. The level of significance would depend on the concentration of OHV use in proximity to water sources and watersheds of concern.

Expanding the Divide Basin Wild Horse HMA to include the entire JMH planning area could serve to better distribute wild horses and reduce use on riparian areas within the current HMA. Conversely, this action could cause additional adverse impacts on riparian areas because more riparian areas would be included in the expanded HMA. Introducing wild horse grazing activities to new areas could result in overuse of riparian areas, leading to accelerated erosion and sedimentation of water resources. This effect could be minimized by ensuring that no more than 100 horses would be allowed in the expansion area. However this

would likely not be realized until herd levels reach and maintain the AML, as wild horses currently inhabit areas outside the HMA boundaries.

Benefits to watershed resources from wildlife management activities would most likely increase under this alternative over the No Action Alternative because of expanded protection and habitat enhancement for wildlife resources.

Impacts related to special management areas would be similar to those of Alternative 2, but not as great. Management actions associated with fewer expansions and designations of special management areas under this alternative would result in fewer limitations and restrictions on surface disturbing activities.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts would be less extensive because of limitations put on development, livestock grazing, and other surface disturbing activities. Adaptive management strategies would allow the area of disturbance to be shifted over time, with emphasis on development and wildlife needs. Areas with high levels of activity, combined with increased OHV use, could create areas of concentrated disturbance that would increase the potential for surface water degradation. Reclamation of disturbed areas would be the key to reducing overall impacts and allowing the use of the two different areas to be exchanged over time.

4.4.2.6 Preferred Alternative

Management of heritage resources would have an insignificant impact on watershed health and water quality. Management actions generally focus on the protection or preservation of heritage sites, which in turn benefit water resources by limiting or excluding surface disturbing activities on or near such sites. Data recovery excavations could adversely affect watershed resources via surface disturbances and vegetation removal if not properly conducted. Indirect effects could occur when avoidance of cultural sites directs activities to other areas, possibly concentrating uses and increasing adverse impacts on local watersheds. However, because of the limited activity allowed in proximity to water resources, any adverse impacts would be insignificant. Moreover, protection measures afforded by the National Historic Preservation Act would further mitigate any potential adverse impacts. Impacts on water sources near the paleosol deposition area would most likely be less extensive than under the No Action Alternative because of the management of this area as an archeological district. Such management would increase protections from surface disturbing activities, thereby reducing adverse impacts to nearby water sources.

Fire could have both beneficial and adverse effects on water resources. Beneficial and adverse impacts could be either short- or long-term depending on fire size and type. Impacts could include increased runoff from exposed soils as well as sedimentation of surface waters. Wildfires usually have more adverse impacts than prescribed burns because wildfires generally cover larger areas and remove more vegetation, and if burning outside established prescription, often burn with enough heat to adversely affect soil organisms as well as kill the root system of some plants. This could result in long-term adverse impacts by compromising future plant rejuvenation and growth rates. Fire suppression activities could cause increased soil erosion resulting from fire line construction and heavy equipment transport. The significance of any impact would depend on the amount of area burned, fire type, proximity to a water source, amount of sedimentation, and rate of revegetation. Prescribed fire burning within prescription areas would generally have a beneficial effect on watershed health by

increasing age and species diversity of plant communities, promoting thicker vegetation growth which could slow erosion rates, and enhancing nutrient cycling. These effects are generally long-term. The minimal amount of proposed prescribed burns (approximately 5,000 acres), and the requirements for these activities under this alternative (e.g., post-treatment rest, mosaic patterns, and limiting suppression activities to existing roads and trails), would minimize short-term adverse impacts by limiting the amount of exposed ground susceptible to erosion. Full fire suppression would be applied to basin big sagebrush/lemon scurfpea vegetation associations. This vegetation association helps stabilize the sand dunes and maintains the integrity and stability of the watershed in which it grows.

Livestock grazing could have localized impacts on watershed resources and water quality. Soil compaction and loss of vegetative cover could result in reduced infiltration and increased runoff and sedimentation of surface waters. Other potential adverse impacts from livestock grazing activities could include channel destabilization, nutrient loading of surface waters, and promotion of invasive plant species. Implementation of healthy rangeland standards, guidelines for livestock grazing, and DPC objectives would help ensure proper management of livestock resources and serve to minimize adverse impacts to watershed resources and water quality.

Certain requirements and mitigation measures for livestock grazing operations would further ensure that impacts are minimized. Livestock water developments and range improvements would be designed to improve resource conditions and livestock distribution. They generally distribute livestock within the pasture/allotment in an effort to prevent livestock concentration and overuse of forage. The immediate area surrounding range improvements generally would be adversely affected because of construction disturbances (particularly for water developments) and livestock concentrations around water developments. This would accelerate runoff and erosion within the affected area and could adversely impact nearby surface waters by increasing sediment loads. With proper planning and effective management of range improvements, any adverse impacts on water resources would be minimized to acceptable levels. Within sensitive wildlife habitat, livestock water developments would be allowed only if resource conditions were improved. This could potentially further benefit water resources through improved construction planning of such developments. Riparian exclosures would be constructed as needed to keep livestock out of sensitive riparian areas. Such actions would most likely have a beneficial impact on watershed health and water quality. Prohibiting placement of salt and mineral supplements within 500 feet of riparian areas would minimize soil compaction and subsequent runoff near surface waters.

Riparian areas would be managed to attain PFC as the minimum acceptable level of ecological condition. This would have a beneficial impact on watershed resources and water quality through helping to stabilize stream banks, reduce erosion and sediment yield, promote vegetative cover, and enhance water quality. Watershed assessments, increased monitoring efforts, and implementation of mitigation measures would improve watersheds with sensitive baseline conditions, having a long-term beneficial impact to the resource. Aquatic, wetland, and riparian habitat would not be disposed unless exchanged for lands with equal or greater value (including monetary and functional resource values).

BLM would continue to participate with federal, state, and local government agencies and the Colorado River Salinity Control Forum to develop and implement salinity control plans for the basin, and to maintain existing and future applicable water quality plans.

Surface disturbing activities such as those associated with the construction of linear ROWs for pipelines, transmission lines, and communication lines; and oil and gas development including construction of well pads, mud pits, and roads, could impact water resources. Land clearing and grading activities necessary for construction remove vegetation and compact soils, which contributes to increased erosion and subsequent sedimentation of local surface waters. Implementation of standard practices and mitigation measures would help minimize long-term adverse impacts on water resources by stabilizing soil conditions and promoting revegetation of disturbed areas. Disturbed sites would be monitored for effective reclamation, and linear ROWs would avoid or be excluded from sensitive areas whenever possible. If sensitive areas could not be avoided, appropriate mitigation measures would be applied. Surface disturbance would be controlled within 500 feet of riparian areas, wetlands, and 100-year floodplains. Permanent facilities (other than linear facilities) would not be allowed in 100-year floodplains, or riparian or wetland areas, and linear ROWs would be identified and collocated as practicable. Controlled use means that surface disturbing activities would avoid these areas unless a site-specific analysis determines that no adverse impacts would occur on water resources. These limitations would ensure that any adverse impacts on water resources would not be significant. Some surface disturbance activities (e.g., reconstruction of crossing, road surfacing, gabions, etc.) may serve to maintain or improve water quality. The adaptive management strategy for mineral development under this alternative would initially preclude some valid existing oil and gas leases from being developed, potentially resulting in less impact than under the No Action Alternative. However because of the uncertainty of the outcome of this adaptive management strategy, the level of long-term impact is not known. The level of significance associated with these activities would be dependent on the amount of area ultimately developed over the planning period.

Ground water could be affected during construction of drill pads or through other exploration and development activities. Improper casing and cementing of wells, undetected spills, or leachate from produced water or mud pits could potentially introduce contaminants to the ground water. Chemicals used for production drilling could cause local contamination of soil and ground water if not properly managed. Construction of drilling pads, proper disposal practices, proper casing and cementing, and recycling of drilling fluids would be in accordance with BLM guidelines and should minimize adverse effects to ground water. Hydrological investigations would be conducted prior to coalbed methane development to determine whether any connection exists between surface waters and the aquifer that would be dewatered. Appropriate measures would be taken to prevent adverse impacts on water quality during dewatering. Dewatering during coalbed methane production could reduce the quantity of ground water contained within affected aquifers because the produced water must be reinjected into aquifers of equal or lower quality. In addition, accidental discharges of produced water onto the ground surface could adversely impact nearby surface water quality. The extent of any impact would depend on the quality of the ground water being discharged. Impacts generally would be greater if the produced water is highly saline.

Recreational activities that occur in proximity to water sources could impact watershed resources and water quality, but significant impacts are not anticipated. Camping and hiking adjacent to waterways could cause localized compaction of soils, reduction of vegetation, and bank instability, which in turn could increase sediment, salt, and nutrient loads from increased runoff. Although camping would be allowed in riparian corridors, areas would be closed if resource damage occurs, thereby preventing adverse impacts from becoming significant. Waste products from recreational activities near riparian areas could have a localized adverse effect on aquatic resources. Requiring that special recreation use permits

be reviewed and recommendations made by the Rock Springs Field Office would ensure input from field office resource specialists prior to authorization of special recreation activities. This could reduce impacts on water resources, because such activities would be directed by personnel most familiar with the planning area.

Use of OHVs could have an adverse impact on water resources, especially if OHVs are used in an unauthorized manner. Impacts could include erosion, soil compaction, and increased turbidity from unauthorized stream crossings and use of wetland meadows. OHV use limitations and visitor compliance with BLM's OHV designations would locally contain adverse impacts and help prevent degradation of sensitive watersheds. Riparian areas and 100-year floodplains would be closed to OHV use or OHVs would be limited to existing roads and trails to prevent soil compaction and subsequent runoff. In addition, implementation of OHV designations and educational programs such as the "Tread Lightly" program would further help to reduce adverse impacts to land and water sources.

Vegetation management activities most likely would result in beneficial impacts on watershed resources and water quality. The protective measures afforded to special status plant species and management actions to achieve DPC objectives would have a beneficial effect on watershed resources by maintaining plant diversity and preserving ecological conditions. Preventing and controlling the spread of invasive plant species would also improve watershed health by reducing competition with native plants and maintaining overall biodiversity. Vegetation manipulation to enhance wildlife habitat would cause adverse short-term impacts to watershed resources by removing vegetation and subsequently increasing erosion and sedimentation; however long-term beneficial impacts could be realized by increasing age and species diversity of plants, promoting thicker vegetative growth to slow erosion, and enhancing nutrient cycling.

Long-term beneficial impacts on water resources are anticipated from wildlife habitat management activities. Actions to improve wildlife habitat generally involve the protection of water sources and the promotion of diverse plant communities, which are better able to slow and filter overland flow, reduce erosive forces, and improve water quality. Short-term adverse impacts could occur where wildlife populations concentrate near water sources, potentially increasing erosion and sediment loads.

Management actions for special management areas could maintain or improve water resources. Restrictions on development and other surface disturbing activities would help maintain or improve water sources and prevent accelerated erosion and sedimentation of surface waters. This beneficial impact would most likely be greater than under the No Action Alternative because of implementation of management actions associated with the Greater Sand Dunes Archeological District. This would increase the amount of area subject to surface disturbance restrictions and limitations and thus limit potential adverse impacts resulting from exposed soils and subsequent erosion and runoff into water sources.

Cumulative Impacts. The potential level of cumulative impact to watershed resources is directly related to the amount, timing, and location of the disturbance in relation to vegetation, soils, and established watercourses. Increased sedimentation could result from any activity that disturbs vegetation, causes soil compaction, or channels overland flows (such as road and well pad construction, livestock trampling, and recreational use, especially OHV activity). Concomitant with loss of vegetative cover and soil loss is increased runoff from denuded surfaces, which could destabilize drainages. Appropriate mitigation and

project design during site-specific analysis could minimize off-site sedimentation but would be dependent on design and maintenance.

Effects to ground water resources would be dependent on the level of activity, quality, and maintenance of wells. Improper casing and cementing of wells, undetected spills, or leachate from produced water or mud pits could potentially introduce contaminants to the ground water. The cumulative impact on ground water aquifers from coalbed methane development cannot be determined because of lack of information. Investigation of aquifers and their possible connections to surface waters prior to development would provide the information necessary to determine cumulative impacts and any necessary mitigation. Containment and reinjection of produced waters that are not suitable and claimed for surface use would reduce the potential for surface water contamination and accelerated erosion in ephemeral channels.

Cumulative impacts could be slightly less extensive than under the No Action Alternative because of limitations on development, livestock grazing, and other surface disturbing activities. Adaptive management strategies would allow the area of disturbance to be shifted over time, with emphasis on multiple uses. Areas with high levels of activity, combined with increased OHV use, could create areas of concentrated disturbance that would increase the potential for surface water degradation. Reclamation of disturbed areas would be the key to reducing overall impacts and allowing the use of the two different areas to be exchanged over time.

4.4.3 Impacts on Wild Horses

BLM has the responsibility to protect, manage, and control wild horses. The wild horse program is responsible for monitoring both the land and the herds, removing excess animals, and preparing animals for adoption. The impacts that implementing wild horse management actions would have on other resources and resource users are discussed in those particular resource sections. This section describes potential impacts on wild horses due to the implementation of management actions of other resource management categories.

Adverse impacts on wild horses would be considered significant if available forage is insufficient to sustain the AML of the herd or if the AML cannot be achieved or maintained.

For analysis purposes, it is assumed there would be a 20 percent annual increase in horse numbers, and gathering would occur approximately every 2 years. The Divide Basin Wild Horse Herd would continue to exceed the AML of 415 to 600 horses over the short term but would ultimately achieve this objective over the long term because of gathering efforts. Therefore the analysis of environmental impacts associated with wild horses is based on the AML rather than the current population level. It is also assumed that approximately 1 acre would be disturbed, and vegetation and forage removed, through constructing and using wild horse traps every 2 years for gathering.

4.4.3.1 Common to All Alternatives

Impacts on wild horses generally result from activities that affect forage levels, water sources, or allotted acreages within HMAs.

Management of heritage resources generally would be low impact, limited to relatively small areas, and not anticipated to have measurable effects on wild horse forage. Even under the most intense management (i.e., excavation), the amount of acreage disturbed would likely be

very small. The most likely adverse impact on wild horses would be temporary displacement while human activity occurs on the site. Limitations on surface disturbing activities near heritage sites could benefit wild horses by protecting vegetation resources, which in turn could maintain or enhance forage conditions.

Both wildland fires and prescribed burns could have short-term adverse impacts on wild horses because of loss of forage resources. However fire has the potential to improve the forage production capacity of a given area and convert shrub habitat to grasslands. This would provide long-term benefits to wild horses by providing increased levels of preferred forage.

Livestock grazing activities could benefit or adversely affect wild horses, as their food source overlaps with that of domestic livestock. However, because of the provisions and restrictions of grazing management actions, the overall effects would likely be beneficial. Implementation of the Wyoming Standards for Healthy Rangelands and Guidelines for Livestock Grazing would help ensure a healthy rangeland condition, thereby providing adequate forage levels for wild horses. Most range improvements or water developments designed to facilitate livestock management would also benefit wild horses and their management.

In general, watershed management activities would benefit wild horses through enhancement of vegetation resources aimed at reducing erosion and improving water quality. Requiring PFC as the minimum acceptable level of ecological condition for all riparian habitat would maintain and improve the health of both upland and riparian vegetation, which would have the indirect effect of increasing forage levels available for wild horses. Riparian management enclosures could have minor adverse effects by excluding horses from water and forage.

Surface disturbing activities associated with the construction of linear ROWs for pipelines, transmission lines, communication lines, and roads; and oil and gas development including construction of well pads, mud pits, and roads, could adversely impact wild horses. Land clearing and grading activities necessary for construction remove vegetation (i.e., result in loss of forage resources) and create disturbance by human activity. Standards for reclamation of linear surface disturbances are adequate to mitigate any potential adverse impact on wild horses due to vegetation removal. Effects from most mineral development would be temporary, as the vegetative conditions on most sites are ultimately reclaimed, and displacement from areas experiencing increased human activity related to mineral development would be anticipated not to be long-term.

Vegetation management activities most likely would benefit wild horses and their habitat. Any actions designed to enhance vegetative conditions would indirectly benefit wild horses by enhancing and increasing forage production. Vegetation treatments and manipulation would cause adverse short-term impacts on wild horses through vegetation removal, but long-term benefits would be realized because of enhanced forage production. Preventing and controlling the spread of invasive plant species would also benefit wild horses by reducing competition with native plants, consequently maximizing forage production. Implementation of healthy rangeland standards would ensure that any impacts would not significantly impact wild horses or their habitat.

Management actions to improve habitat for wildlife, prevent habitat fragmentation, and provide protection from human activity would benefit wild horses and their habitat by maintaining and improving forage production.

Recreational activities such as camping and hiking would not likely have any impact on wild horses. Some adverse impacts may result from the temporary removal of vegetation in concentrated areas used by special recreation groups, but such impacts would be negligible. The use of OHVs in designated areas and on existing roads and trails would not adversely impact wild horses because this activity would not affect any forage base, however some temporary displacement of horses may occur.

Implementing wild horse management actions would have an overall benefit to wild horses. Achieving and maintaining the AML and implementing monitoring and gathering plans would serve to limit wild horse population numbers and achieve a balance among forage resources, other resource uses, and wild horse management. Establishing viewing sites and providing interpretive information on wild horses would serve to educate the public on the importance of appropriately managing the wild horse program. The impact of gathering activities on wild horses would be addressed during site-specific analyses.

The protections afforded to special management areas would generally result in beneficial impacts to wild horses. Protections aimed at conserving sensitive vegetation communities, and limitations on mineral development and other surface disturbing activities, would benefit wild horses by enhancing overall vegetation conditions and subsequently increasing forage production. Restrictions on gathering of wild horses in these areas may have minor impacts on the wild horse program. Removing horses from these areas may require that horses be moved a greater distance to access available trap sites.

4.4.3.2 No Action Alternative

Impacts resulting from management of heritage resources, the fire program, recreation, vegetation, wildlife, and special management areas would be the same as impacts common to all alternatives.

Livestock grazing activities would have similar impacts on wild horses as are common to all alternatives. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would continue to be similar to historic levels and not result in any additional grazing pressure on available forage. Construction and maintenance of livestock range improvements and water developments would be designed to improve resource conditions and/or enhance livestock distribution. This would maintain healthy forage conditions, prevent overuse of vegetation resources, and ultimately benefit wild horses. Prohibiting placement of salt and mineral supplements within 500 feet of riparian areas would help ensure that water quality would remain adequate for consumption by wild horses.

Management actions for water quality would generally benefit wild horses. Managing wetlands in accordance with current laws and limiting surface disturbance within 500 feet of riparian areas and floodplains would aid in maintaining or improving forage conditions within these areas. Adverse impacts may occur from maintaining and developing riparian exclosures, which would reduce the amount of available forage and limit access to water sources.

Impacts on wild horses from mineral development and other surface disturbances (i.e., ROWs) would include temporary displacement and direct removal of vegetation resources, resulting in a reduction in available forage. The majority of the Divide Basin Wild Horse HMA is currently open to mining claims of some sort, under lease, or would be open to new

leases for oil and gas or linear ROWs for pipelines and communication and transmission lines. Construction of mining pits removes forage and habitat for wild horses, and dredging or placer mining effects water sources, which could have adverse impacts on the long-term viability of wild horse habitat. It is assumed that the amount of mineral development that could occur during the planning period would be related to available acreage and development potential. Oil and gas development potential within the HMA varies, and thus the amount of available forage that could be removed or disturbed would depend on the level of development that would occur.

Wild horse management actions could provide further benefits by allowing construction of water developments designed to improve herd distribution and manage forage utilization.

Maintaining the current HMA boundaries could adversely impact the management of wild horses. Currently wild horses are using habitat outside the established HMA boundary and will continue to do so. Total removal of these horses is not possible because other horses will move into the areas as horses are removed. These “outside area” wild horses will not count toward the AML for the Divide Basin HMA, and the need to completely remove them will continue.

Cumulative Impacts. Increasing wildlife objectives could increase competition for forage, which may impact existing use patterns and distribute wild horses into other areas. Development activities are not expected to impact wild horses in the long term, given their adaptability and the low level of actual vegetation removed by development activities. Wild horses will continue to occupy areas outside the existing HMA boundary and as such will be considered “excess,” subject to immediate removal. This would continue to complicate wild horse management. Cumulative effects on wild horses are expected to be minimal and insignificant under the No Action Alternative.

4.4.3.3 Alternative 1

Impacts resulting from management of heritage resources, the fire program, recreation, vegetation, and special management areas would be the same as impacts common to all alternatives.

Livestock grazing management actions could have adverse impacts by reducing the amount and quality of forage available to wild horses. The anticipated use of livestock AUMs would increase over the planning period to the permitted active use amount, which is approximately double the historic use. This would increase pressure on forage and water resources within allotments that are not currently close to using their fully permitted AUMs. Less restrictive measures for range improvements, water developments, and salt placement could limit protections to forage and surface water resources. The level of significance of adverse impacts on wild horses would depend on the overall condition of the range within the HMA and actual increase in AUM usage. The implementation of healthy rangeland standards and guidelines for livestock grazing would help minimize any adverse impact on forage and water resources.

Watershed management actions would be less restrictive under this alternative, which could reduce and/or increase benefits to wild horses compared to the No Action Alternative. Reducing the avoidance area around riparian zones and floodplains to 250 feet would provide less protection to vegetation resources from surface disturbing activities and possibly result in

degraded forage conditions. Removing riparian exclosures could benefit wild horses by increasing the amount of available forage.

Although this alternative would provide the greatest opportunity for mineral development which could result in greater losses to forage resources, impacts would be similar to those of the No Action Alternative. The majority of the Divide Basin Wild Horse HMA would be open to mining claims, under lease, or would be open to new leases for oil and gas or linear ROWs for pipelines and communication and transmission lines. Development potential within the HMA varies, and thus the amount of available forage that would be removed or disturbed would depend on the level of development that would occur. The level of development would likely be more under this alternative because of fewer limitations imposed on developers, and thus an adverse impact on wild horses could result if development outpaces reclamation and replacement of habitat. This could also have indirect adverse impacts within the planning area or HMA if wild horses are displaced elsewhere for long periods of time.

Benefits from wildlife management may not be quite as extensive as under the other alternatives because of less restrictive actions to improve wildlife habitat.

Wild horse management actions could provide further benefits by allowing the construction of water developments designed to improve herd distribution and manage forage utilization. The existing wild horse HMA boundary would remain the same. Currently wild horses are using habitat outside the established HMA boundary and will continue to do so. These horses will not count toward the AML for the Divide Basin HMA, and the need to completely remove them will continue. Total removal is not possible, however, as other animals will move into these areas as animals are removed.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts could be greater because of further increases of wildlife objectives and potential increased grazing activities. Although development activities are not expected to impact wild horses given their adaptability, the amount of habitat alteration due to development is highest under this alternative and could rise to the level of causing considerable reductions of the current forage base. However, because their ability to move into other areas, cumulative impacts on wild horses are not expected to be significant.

4.4.3.4 Alternative 2

This alternative would reestablish the boundaries of the Divide Basin Wild Horse HMA to exclude the JMH planning area. A gathering plan would be developed and implemented to remove wild horses from the planning area and maintain the AML within the reestablished boundaries of the HMA outside the planning area. Until reestablishment of the HMA boundaries and gathering of excess wild horses occur, management actions associated with other land and water resources would generally have beneficial impacts to wild horses because of increased protection on forage and water resources. The potential could exist for adverse cumulative impacts in the reestablished HMA outside the planning area if the concentration of wild horses in a smaller area causes overuse of available forage and water resources.

Wild horses currently exist in favorable habitats outside the existing HMA boundary. The only way to ensure that the horses would not stray from the reestablished HMA would be to create a barrier to their movement. This would require the construction of more than 30 miles

of fence, which would subdivide at least two grazing allotments. This could have impacts on livestock grazing use.

Cumulative Impacts. Modifying the Divide Basin HMA boundary to exclude the planning area from the HMA would concentrate horses in a smaller area (that portion of the existing Divide Basin HMA not included within the boundary of the planning area). This could result in increased forage competition among wild horses and with other large ungulates. Given their adaptability and the remaining size of the HMA, cumulative impacts are not expected to be significant.

4.4.3.5 Alternative 3

Impacts resulting from management of heritage resources, the fire program, recreation, vegetation, and wildlife would be the same as impacts common to all alternatives.

Livestock grazing activities could have adverse impacts on wild horses as are common to all alternatives and similar to the No Action Alternative. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would continue to be similar to historic levels and not result in any additional grazing pressure on available forage. The construction and maintenance of livestock range improvements and water developments would be designed to improve resource conditions and/or enhance livestock distribution. This would maintain healthy forage conditions, prevent overuse of vegetation resources, and ultimately benefit wild horses. Prohibiting placement of salt and mineral supplements within one-quarter-mile of riparian areas would help ensure that water quality would remain adequate for consumption by wild horses.

Any actions that limit the extent of surface disturbing activities would help minimize adverse impacts on available forage and water sources, having a beneficial impact on wild horses. A greater amount of land area would be subject to controlled surface use requirements or ROW exclusion, withdrawn from mineral location, or managed under a transportation plan. Surface disturbing activities would be controlled within 500 feet to one-quarter-mile of riparian areas, wetlands, and 100-year floodplains, but parameters could vary on a case-by-case basis.

Benefits to wild horses from wildlife management activities would most likely increase under this alternative because of expanded protection and habitat enhancement for wildlife resources.

This alternative would expand the Divide Basin Wild Horse HMA to include the entire JMH planning area. This would have an overall beneficial impact by improving wild horse management and providing additional habitat for wild horses. The horses now outside the HMA would be counted against the AML for the HMA, which at present they are not. The “outside area” horses would gain legal status and would no longer be considered outside-HMA animals. Replacement of removed horses by other animals would not re-create the outside-HMA situation. No barrier would need to be constructed to limit wild horse use to the present HMA boundary (No Action, Alternative 1) or reduced HMA boundary (Alternative 2). Increased flexibility in where to remove horses within a much larger area would allow for more responsiveness to site-specific needs. For example, more horses could be removed from the areas within the existing HMA boundary because the horses in the expansion area would count toward the AML. However, expanding the HMA could also cause adverse impacts by creating additional difficulty in gathering excess horses and assessing herd population size.

Management actions related to special management areas would provide additional benefits for wild horses. Management actions associated with the expansion of existing ACECs, historic viewsheds, and designation of new ACECs and WSAs would increase the amount of area subject to surface disturbance restrictions and limitations and thus protect available forage and water sources.

Cumulative Impacts. Modifying the Divide Basin Wild Horse HMA to include the entire planning area has the potential to distribute horses across a larger area and to decrease forage competition among species. Cumulative effects are expected to be positive and substantial for the wild horses and wild horse management.

4.4.3.6 Preferred Alternative

The management of heritage resources generally would be low impact, limited to relatively small areas, and not anticipated to have measurable effects on wild horse forage. Even under the most intense management (i.e., excavation), the amount of acreage disturbed would likely be very small. The most likely adverse impact on wild horses would be temporary displacement while human activity occurs on the site. Limitations on surface disturbing activities near heritage sites could benefit wild horses by protecting vegetation resources, which in turn could maintain or enhance forage conditions. Impacts on vegetation resources near the paleosol deposition area would most likely be less extensive than under the No Action Alternative because of designation of this area as an archeological district. This designation would increase protections from surface disturbing activities, thereby reducing adverse impacts to forage resources.

Both wildland fires and prescribed burns could have short-term adverse impacts on wild horses because of loss of forage resources. However fire has the potential to improve the forage production capacity of a given area and convert shrub habitat to grasslands. This would provide long-term benefits to wild horses by providing increased levels of preferred forage.

Livestock grazing activities could benefit or adversely affect wild horses, as their food source overlaps with that of domestic livestock. However, because of the provisions and restrictions on grazing management actions, overall effects would likely be beneficial. Implementation of the Wyoming Standards for Healthy Rangelands and Guidelines for Livestock Grazing would help ensure a healthy rangeland condition, thereby providing adequate forage levels for wild horses. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would continue to be similar to historic levels and not result in any additional grazing pressure on available forage. The construction and maintenance of livestock range improvements and water developments would be designed to improve resource conditions and/or enhance livestock distribution. This would maintain healthy forage conditions, prevent overuse of vegetation resources, and ultimately benefit wild horses. Within sensitive wildlife habitat, livestock water developments would be allowed only if resource conditions were improved. This could potentially further benefit wild horses through improved construction planning of such developments. Prohibiting placement of salt and mineral supplements within 500 feet of riparian areas would help ensure that water quality would remain adequate for consumption by wild horses.

In general watershed management activities would benefit wild horses through enhancement of vegetation resources aimed at reducing erosion and improving water quality. Requiring PFC as the minimum acceptable level of ecological condition for all riparian habitat would

maintain and improve the health of both upland and riparian vegetation, which would have the indirect effect of increasing forage levels available for wild horses. Managing wetlands in accordance with current laws and limiting surface disturbance within 500 feet of riparian areas and floodplains would further aid in maintaining or improving forage conditions within these areas. Riparian management exclusions could have short-term adverse effects by excluding horses from water and forage. Over the long term, such exclusions would benefit wild horses by improving water quality and riparian forage conditions. However, the provision under this alternative that allows exclusions to be removed could partially offset these impacts.

Surface disturbing activities associated with the construction of linear ROWs for pipelines, transmission lines, communication lines, and roads; and oil and gas development including construction of well pads, mud pits, and roads, could adversely impact wild horses. Land clearing and grading activities necessary for construction remove vegetation (i.e., result in loss of forage resources) and create disturbance by human activity. Standards for reclamation of linear surface disturbances would help mitigate potential adverse impacts on wild horses due to vegetation removal. Effects from most mineral development would be temporary, as the vegetative conditions of most sites are ultimately reclaimed, and displacement from areas experiencing increased human activity related to mineral development is not anticipated to be long-term. Construction of mining pits removes forage and habitat for wild horses, and dredging or placer mining effects water sources, which could have adverse impacts on the long-term viability of wild horse habitat.

It is assumed that the amount of mineral development that could occur during the planning period would be related to available acreage and development potential. Oil and gas development potential within the HMA varies, and thus the amount of available forage that could be removed or disturbed would depend on the level of development that would occur. The adaptive management strategy for mineral development under this alternative initially would preclude some valid existing oil and gas leases from being developed, potentially resulting in less impact than under the No Action Alternative. However, because of the uncertainty of the outcome of this adaptive management strategy, the level of long-term impacts is unknown. The level of significance associated with these activities would be dependent on the amount of area ultimately developed over the planning period.

Vegetation management activities most likely would benefit wild horses and their habitat. Any actions designed to enhance vegetative conditions would indirectly benefit wild horses by enhancing and increasing forage production. Vegetation treatments and manipulation would cause adverse short-term impacts on wild horses through vegetation removal, but long-term benefits would be realized because of enhanced forage production. Preventing and controlling the spread of invasive plant species also would benefit wild horses by reducing competition with native plants, consequently maximizing forage production. Implementation of healthy rangeland standards would ensure that any impacts would not significantly impact wild horses or their habitat.

Management actions to improve habitat for wildlife, prevent habitat fragmentation, and provide protection from human activity would benefit wild horses and their habitat by maintaining and improving forage production.

Recreational activities such as camping and hiking would not likely have any impact on wild horses. Some adverse impacts could result from the temporary removal of vegetation in concentrated areas used by special recreation groups, but such impacts would be negligible.

The use of OHVs in designated areas and on existing roads and trails would not adversely impact wild horses because this activity would not affect the overall forage base, however some temporary displacement could occur.

Implementing wild horse management actions would have an overall benefit to wild horses. Achieving and maintaining the AML and implementing monitoring and gathering plans would serve to limit wild horse population numbers and achieve a balance among forage resources, other resource uses, and wild horse management. The impact of gathering activities on wild horses would be addressed during site-specific analyses. Establishing viewing sites and providing interpretive information on wild horses would serve to educate the public on the importance of appropriately managing the wild horse program. However, maintaining the current HMA boundaries as specified under this alternative could adversely impact the management of wild horses. Currently wild horses are using habitat outside the established HMA boundary and will continue to do so. Total removal of these horses is not possible because other horses will move into these areas as horses are removed. These “outside area” wild horses will not count toward the AML for the Divide Basin HMA, and the need to completely remove them will continue.

Management actions for special management areas would generally result in beneficial impacts to wild horses. Protections aimed at conserving sensitive vegetation communities, and limitations on mineral development and other surface disturbing activities, would benefit wild horses by enhancing overall vegetation conditions and subsequently increasing forage production. Restrictions on gathering of wild horses in these areas may have minor impacts on the wild horse program. Removing horses from these areas may require that horses be moved a greater distance to access available trap sites. These impacts would slightly greater than under the No Action Alternative because of implementation of management actions associated with the additional of a special management area.

Cumulative Impacts. Increasing wildlife objectives could increase competition for forage, which may impact existing use patterns and distribute wild horses into other areas. Development activities are not expected to impact wild horses in the long term, given their adaptability and the low level of actual vegetation removed by development activities. Wild horses will continue to occupy areas outside the existing HMA boundary and as such will be considered “excess,” subject to immediate removal. This would continue to complicate wild horse management. Cumulative effects on wild horses are expected to be minimal and insignificant under the Preferred Alternative.

4.4.4 Impacts on Livestock Grazing

BLM identifies lands available for livestock grazing, implements grazing management practices, and authorizes permitted use for maintaining ecological balance and multiple use relationships. Livestock grazing is not a natural, physical, or biological resource but is a user of those resources. The impacts that implementing livestock grazing management actions would have on other resources and resource users are discussed in those particular resource sections. This section describes potential impacts on livestock grazing operations due to implementation of management actions for other resource management categories. Implementing resource management actions would not have direct environmental impacts on livestock grazing but would generally have indirect, nonenvironmental impacts on livestock operators.

Impacts on livestock grazing would be considered significant if resource management actions cause a reduction in forage levels that would require livestock operators to reduce their permitted AUMs.

It is assumed that livestock grazing would occur throughout the entire JMH CAP planning area. Anticipated grazing use is assumed to increase over the planning period to the fully permitted active use amount (26,830 AUMs) under Alternative 1 but to maintain the historic use (11,569 AUMs) under all other alternatives. Although some areas are more suitable for different classes of livestock, the impacts are assumed similar for all areas and therefore are not discussed separately. The rate of revegetation of disturbed areas varies by type of activity. Construction of fences, pipelines, water wells, troughs, and reservoirs would cause a loss of some soil and vegetation. Vegetation would be reestablished along fences and pipelines within 3 to 5 years, whereas water wells, troughs, and reservoirs would remain disturbed during their useful life and would revegetate upon abandonment. Except for Alternative 2, approximately 23 livestock water developments (e.g., pits, ponds, and water wells) would be constructed or rebuilt in the JMH CAP planning area over the 20-year planning period, disturbing approximately 23 acres. Under Alternative 2, only 11 livestock water developments would be constructed or rebuilt in the JMH CAP planning area over the 20-year planning period, disturbing approximately 11 acres. Prescribed burns and wildfires would cause a loss of vegetation for a period of 1 to 2 years and a change in vegetation for 15 to 30 years.

4.4.4.1 Common to All Alternatives

Impacts on livestock grazing activities are generally the result of activities that affect forage levels or allowable AUMs for individual grazing allotments. Grazing management practices and permitted use must achieve the desired outcomes outlined in the Wyoming Standards for Healthy Rangelands.

The management of heritage sites would generally be limited to relatively small areas. Even under the most intense management (i.e., excavation), the amount of acreage disturbed would be very small. These activities are not anticipated to have measurable impacts on livestock forage resources. Impacts could occur if heritage sites are fenced from livestock use, causing a loss of available forage. However, given the size of most heritage sites, this impact would be minimal. Other impacts may occur because of restrictions on surface disturbing activities near heritage sites, which may preclude the construction of range improvements designed to facilitate livestock grazing. Conversely, such restrictions would provide protection to vegetation resources, which in turn could maintain or enhance forage conditions.

Both wildland and prescribed fires would have short-term impacts on livestock grazing because of a loss of forage resources. However, over the long term, fire has the potential to improve forage production capacity and convert shrub habitat to grasslands. This would benefit livestock by providing increased levels of preferred forage. The requirement to rest a burn area to allow new vegetation to establish could have a short-term impact on livestock operators, as the amount of available forage would be reduced for the localized area of the burn. The level of significance of this impact would depend on the extent of the burn area and season of use.

Implementation of livestock grazing management actions could have both beneficial and adverse impacts on livestock operators. Most impacts would occur from adjustments for the purposes of complying with healthy rangeland standards. Such adjustments could include

modified turnout dates, shorter grazing periods, growing season rest, riparian exclosures, forage utilization levels, and livestock conversions. Although these adjustments would benefit long-term forage production and subsequently livestock growth rates, adverse impacts on livestock operators could occur in the short term. The extent of any impact on livestock grazing operations would depend on the flexibility of the individual operator to implement and respond to these adjustments.

Livestock water developments would provide additional watering sites, thereby improving livestock distribution and reducing competition with other grazers. Restrictions on salt and mineral placement could require additional planning and effort but would distribute forage use and reduce impacts to other resources including water sources. Livestock grazing management could also benefit from distribution of livestock and the maintenance or improvement of vegetation. This would increase available forage and help achieve healthy rangelands.

Watershed management would enhance vegetation resources by reducing erosion and improving water quality. Requiring PFC as the minimum acceptable level of ecological condition for riparian areas would maintain and improve the health of riparian vegetation, which would have the indirect effect of increasing forage levels for livestock. However, short-term adverse impacts on operators could result from the need to remove livestock from allotments and/or pastures or from construction of riparian exclosures in order to achieve a healthy rangeland standard.

Surface disturbing activities associated with the construction of linear ROWs for pipelines, transmission lines, communication lines, and roads; and mineral development including construction of well pads, pits, and roads, could impact livestock grazing. Land clearing and grading activities necessary for construction remove vegetation (i.e., result in loss of forage resources). Standards for reclamation of linear surface disturbances are adequate to mitigate any adverse impact related to short-term vegetation removal. Effects from most mineral development would be short-term, as the vegetation conditions on most sites ultimately would be reclaimed. Salable mineral activity would not be expected to have any affect on livestock grazing management because of the limited activity and limited area of vegetation removal. Any mineral withdrawals would prevent vegetation removal and a potential subsequent decrease in the forage base.

Vegetation management activities most likely would most result in beneficial impacts on livestock grazing management. Any actions designed to enhance vegetative conditions would indirectly benefit livestock by enhancing and increasing forage production. Vegetation treatments and manipulation could cause short-term effects to livestock grazing through vegetation removal, but long-term benefits would be realized because of enhanced forage production. Preventing and controlling the spread of invasive plant species would also benefit livestock by reducing competition with native plants, consequently maintaining or improving forage production.

Activities associated with wildlife habitat management would generally benefit livestock grazing operations through habitat enhancement measures that consequently improve forage production. However, adverse effects could also result because of the inherent competition between big game species and livestock over forage resources. Because of dietary preference, this competition is more pronounced with elk than with antelope or mule deer. Similar to livestock, elk are considered grazers that prefer grasses, whereas the preference for mule deer and antelope is to browse shrub species. Large concentrations of these big game

animals occur within portions of the planning area (Map 51), which may require some livestock operators to alter grazing management practices to comply with healthy rangeland standards. Uneven distribution of big game causes some grazing allotments to receive a disproportionate amount of the total wildlife grazing within the planning area, thereby putting additional strain on the forage resources within those allotments.

This is especially true for allotments located either entirely or partially within the south-central portion of the planning area, including the core area, which is birthing and wintering habitat for a majority of the big game populations that inhabit the planning area. Although the population objective for elk would vary between the No Action Alternative (500) and the action alternatives (1,200), impacts on allotments located within the south-central portion of the planning area would remain approximately the same among the alternatives because of the expectation that the elk population size in this area would not change considerably. Achieving wildlife population objectives (section 4.4.6, wildlife assumptions) and implementing the various management options offered to livestock operators would help to minimize effects. Further effects could occur if management actions result in increased wildlife populations, which could reduce available forage for livestock. It is unlikely that this would occur with Wyoming Game and Fish Department (WGFD) efforts to maintain objectives.

Recreational activities likely would not impact livestock grazing activities, other than from limited human disturbance. Some impacts may result from the temporary removal of vegetation by campers in concentrated areas, but any impact would be negligible. The use of OHVs would not impact livestock if this recreational activity stays within authorized areas. However, unauthorized OHV activity could affect livestock grazing by damaging vegetation resources and consequently reducing available forage.

Activities in special management areas could have both beneficial and adverse impacts to livestock grazing activities. Restrictions on mineral development and other surface disturbing activities would help prevent the removal of forage resources but could also preclude the construction of range improvements designed to facilitate livestock grazing. In addition, protections aimed at conserving sensitive vegetation communities would affect livestock grazing by enhancing overall vegetation conditions and subsequently increasing forage production.

4.4.4.2 No Action Alternative

Impacts resulting from management of heritage resources, recreation, vegetation, wildlife, and special management areas would be the same as impacts common to all alternatives.

Fire management activities would have similar impacts on livestock grazing as described for impacts common to all alternatives. Full fire suppression for basin big sagebrush/lemon scurfpea vegetation associations could result in short-term impacts on livestock grazing through loss of plant diversity. This vegetation association stabilizes the sandy soils in this area of JMH and provides habitat and forage primarily for wildlife. Because of the relatively limited extent of these vegetation associations, impacts on livestock grazing would not be significant.

Management actions for livestock grazing would allow operators the flexibility to manage livestock in a manner that would not adversely impact other resources. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs

would continue to be similar to historic levels and not result in any additional grazing pressure on available forage. Requiring that livestock range improvements and water developments improve resource conditions and/or enhance livestock distribution could require additional planning when constructing such developments, but would improve long-term forage production and prevent overuse of vegetation resources. Similarly, more planning and effort may be required of livestock operators to comply with requirements for placement of salt and mineral supplements (prohibited within 500 feet of riparian habitat, historic trails, and special status species habitat), but long-term benefits would be realized by improving livestock distribution and maintaining healthy rangelands.

Effects from watershed management actions would be similar to impacts common to all alternatives. Surface disturbance would be limited within 500 feet of riparian areas and other water resources, conserving forage resources within these areas. However, this could preclude the construction of water developments and range improvements in these areas (unless any water quality impacts could be mitigated). Riparian exclusions could also affect grazing activities by reducing the amount of available forage for livestock, as the exclusions would remain closed to grazing. The extent of this effect on livestock operators would depend on the number, location, and size of exclusions at any given time.

Impacts from mineral exploration and development and from other surface disturbances in support of these activities (e.g., ROWs) would include removal of vegetation resources and therefore a reduction in available forage for livestock. It is assumed that the amount of mineral development that could occur during the planning period would be related to available acreage. Therefore reducing available acreage (i.e., closing or withdrawing areas to mineral development) would serve to diminish development activity and subsequently reduce impacts on livestock grazing. The amount of surface disturbance associated with mineral development would be approximately 200 acres in the most active year and approximately 1,800 acres over the planning period (Appendix 13, Table A13-7), which would represent an insignificant impact on livestock grazing when compared to the size of the planning area. Standards for reclamation of linear surface disturbances would aid in mitigating impacts on livestock grazing related to vegetation removal

Effects from wildlife management on livestock grazing would be similar to impacts common to all alternatives. Competition between big game and livestock over forage resources would be the least intense under this alternative because the population objective for elk would remain at the current level of 500, which could result in slightly less adverse impacts as compared to the other alternatives.

Similar to wildlife, wild horse management activities could result in effects on livestock grazing because of competition over forage resources. However, achieving and maintaining the AML for horses, implementing monitoring and gathering plans, and allowing for water developments would all serve to limit and distribute wild horses, consequently minimizing effects on livestock grazing.

Approximately 9,346 AUMs within the JMH planning area (see Table 4-11 at the end of Chapter 4) would be necessary to support the WGFD herd unit population objectives for elk (500), mule deer (4,000), antelope (6,000), and wild horses (415–600). Estimates of AUMs were based on animal unit equivalents (AUE) specified in the Draft Environmental Impact Statement for the Proposed Grazing Management Program for the Salt Wells-Pilot Butte Area, 1983.

Cumulative Impacts. Reductions in the forage base due to development and other surface disturbing activities, combined with competition for forage resources, would result in cumulative impacts to livestock grazing. This could increase the cost of operations for some operators and possibly reduce the ability to meet the Wyoming Standards for Healthy Rangelands, which could in turn place additional restrictions on livestock grazing (possible short-term reduction in use). Impacts could occur in the short term by limiting grazing to achieve rangeland standards but would be reduced in the long term because of improved rangeland health.

4.4.4.3 Alternative 1

Impacts resulting from management of heritage resources, recreation, and vegetation would be the same as impacts common to all alternatives. Impacts on livestock grazing from the fire management program and wild horses would be the same as those of the No Action Alternative.

Livestock grazing management actions under this alternative generally would benefit operators by allowing for increased flexibility in managing livestock. Less restrictive measures for range improvements, water developments, and salt and mineral placement could create short-term benefits for livestock operators but would limit protections to forage and surface water resources. The anticipated use of livestock AUMs would increase over the planning period to the permitted active use amount, further increasing grazing pressure on forage and water resources. Increased grazing and reduced resource protections could result in significant impacts on livestock grazing if operators are required to reduce their AUMs to achieve healthy rangeland standards.

Watershed management actions would be less restrictive under this alternative. Reducing the avoidance area around riparian areas and floodplains to 250 feet would provide less protection to forage resources from surface disturbing activities but would allow for greater flexibility in constructing water developments and range improvements. In addition, the removal of riparian exclosures would increase available forage for livestock.

This alternative provides the greatest opportunity for mineral development and production, which would result in greater losses to forage resources. The land area available for lease and mining claims would be greatest under this alternative, thus the potential for mineral development would likely increase. This could result in greater surface disturbance that could affect livestock grazing by removing available forage. The amount of surface disturbance associated with mineral development would be approximately 220 acres in the most active year and approximately 2,100 acres over the planning period (Appendix 13, Table A13-7), which would represent an insignificant impact on livestock grazing when compared to the size of the planning area. Reclamation of linear surface disturbances would help mitigate any adverse impact on livestock grazing related to vegetation removal. Effects from most mineral development would be temporary, as the vegetation conditions on most sites ultimately would be reclaimed. However, an adverse impact on grazing could result if development outpaces reclamation and replacement of forage.

Effects from wildlife management on livestock grazing would be similar to impacts common to all alternatives. The beneficial impacts may not be quite as extensive as under the other alternatives because of less restrictive actions to improve wildlife habitat that subsequently benefits livestock grazing. Animal damage control activities under this alternative could directly benefit livestock operations by removing animals known to have killed livestock.

Competition between big game and livestock over forage resources would be the most intense under this alternative, primarily because the anticipated use of livestock AUMs would increase over the planning period to the fully permitted active use amount. In addition, it is anticipated that the elk population objective would be increased to 1,200, which could slightly increase the competition between livestock and wildlife over forage resources. An additional 1,513 AUMs would be required to support the augmented elk population objective—an insignificant increase when compared to the available forage of the total planning area. Allotments located within the south-central portion of the planning area, including the core area, would be disproportionately impacted because of larger populations of big game that inhabit this area (Map 51).

Approximately 10,860 AUMs within the JMH planning area (see Table 4-11 at the end of Chapter 4) would be necessary to support the WGFD herd unit population objectives for elk (1,200), mule deer (4,000), antelope (6,000), and wild horses (415–600). Estimates of AUMs were based on animal unit equivalents (AUE) specified in the Draft Environmental Impact Statement for the Proposed Grazing Management Program for the Salt Wells-Pilot Butte Area, 1983. Utilizing the 26,830 AUMs permitted for livestock, coupled with wildlife use levels, could degrade forage resources on some allotments and subsequently jeopardize compliance with healthy rangeland standards. This could result in significant impacts to livestock grazing activities if operators are required to reduce their AUMs. Implementing appropriate actions for livestock grazing management may be necessary. Such actions could include, but would not be limited to, reduction of permitted AUMs, modified turnout dates, livestock water developments, range improvements, shorter grazing periods, growing season rest, riparian pastures and exclosures, implementation of forage utilization levels, and livestock conversions. For some allotments, reallocation of AUMs among livestock, wildlife, and wild horses could be required to ensure that adequate forage would be available for big game. This could likely result in a reduction of AUMs for livestock but would not be implemented unless it were the only appropriate action for meeting healthy rangeland standards.

Management activities related to special management areas could reduce effects on livestock grazing by eliminating certain management actions which restrict livestock grazing with the removal of the ACEC designation for Steamboat Mountain and the reduction of the viewshed associated with the National Historic Trail Special Recreation Management Area through South Pass. This would reduce the amount of area subject to surface disturbance restrictions and limitations.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts could be greater and possibly significant. Increased development, livestock grazing, and competition over forage resources could increase cumulative impacts given that adequate forage would be provided for wildlife. This could tax forage resources and jeopardize rangeland standards. Impacts would be significant if operators are forced to reduce AUMs in the long term to meet rangeland standards. Decreased grazing restrictions and additional provisions afforded to livestock operators under this alternative could help to offset impacts and reduce the cost of operations.

4.4.4.4 Alternative 2

Effects resulting from management of vegetation resources would be the same as impacts common to all alternatives.

Increased protection would be afforded to heritage resources under this alternative, which could have both beneficial and adverse impacts on livestock grazing as compared to other alternatives. Areas within 300 feet of sites eligible for inclusion in the NRHP would be protected from surface disturbing activities, which could help protect forage resources. However, this limitation could also further restrict the construction of range improvements and water developments within the same area.

Fire management actions would have effects on livestock grazing similar to those of the No Action Alternative. Limited fire suppression for basin big sagebrush/lemon scurfpea vegetation associations would be applied, but any effect on grazing would not be significant.

The increased restrictions placed on livestock grazing activities under this alternative would likely cause greater adverse effects on livestock operators than under the other alternatives. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would be similar to historic levels. Requiring that modified turnout dates be the primary method for meeting healthy rangeland standards could increase costs for livestock operators who are forced to find alternate pastures or feeding areas for their livestock. Increasing the buffer area for salt and mineral placement to one-half mile from riparian areas, historic trails, and special status plant species would require more planning and effort on the part of livestock operators and possibly would increase related costs. Whether the greater distance from these areas provides any further protection than some shorter distance would depend on the topography, drainage patterns, and vegetative cover at a particular location. Restrictions on water developments and range improvements in sensitive wildlife habitats may preclude their construction in some cases, thereby reducing the extent of forage and water accessible by livestock.

Watershed management actions would be more restrictive under this alternative. This would benefit forage conditions but could affect some grazing management activities. Although increasing the amount of area designated as avoidance or no surface occupancy would help prevent destruction of vegetation resources, it would also preclude construction of water developments and range improvements designed to facilitate livestock grazing operations. Surface disturbing activities would avoid an area within 500 feet to one-quarter-mile of riparian areas. Riparian exclosures would also impact grazing activities by reducing the amount of available forage for livestock, as the exclosures would be closed to grazing. The extent of this impact on livestock operators would depend on the number, location, and size of exclosures at any given time during the planning period.

This alternative provides the least opportunity for mineral exploration and development, which would minimize related losses to forage resources. The amount of surface disturbance associated with mineral development would be approximately 170 acres in the most active year and approximately 1,300 acres over the planning period (Appendix 13, Table A13-7), which would represent an insignificant impact on livestock grazing when compared to the size of the planning area. Effects from most mineral development would be temporary, as the vegetation conditions on most sites are ultimately reclaimed. However, an effect on grazing could result if development outpaces reclamation and replacement of forage.

Management actions for wildlife under this alternative could likely provide greater beneficial effects on livestock grazing, as expanded protection and enhancement measures for wildlife resources would limit surface disturbance, human disruption, and improve forage conditions. However these actions could also increase wildlife populations, potentially reducing available forage for livestock. Such impacts would only occur if WGFD efforts to maintain wildlife

population objectives were not adequately employed. Overall effects on livestock grazing could be slightly greater than under the No Action Alternative because it is anticipated that the elk population objective would be increased to 1,200. This would require an increase of 1,513 AUMs for elk, an insignificant increase when compared to the available forage of the total planning area. Animal damage control for livestock protection would be by nonlethal methods, or by lethal methods only if wildlife would benefit. This could have effects on livestock operations if removing animals known to have killed livestock is not as efficient.

Approximately 10,860 AUMs within the JMH planning area (see Table 4-11 at the end of Chapter 4) would be necessary to support the WGFD herd unit population objectives for elk (1,200), mule deer (4,000), antelope (6,000), and wild horses (415–600). Estimates of AUMs were based on animal unit equivalents (AUE) specified in the Draft Environmental Impact Statement for the Proposed Grazing Management Program for the Salt Wells-Pilot Butte Area, 1983.

This alternative would reestablish the boundaries of the Divide Basin Wild Horse HMA to exclude the JMH planning area. A gathering plan would be developed and implemented to remove wild horses from the planning area and to maintain the AML within the reestablished boundaries of the HMA outside the planning area. This would likely affect livestock grazing by reducing competition with wild horses for forage and water resources. Certain allotments would be subdivided by construction of a fence designed to limit wild horse movement to the reestablished HMA boundary. Adverse impacts could occur from limiting livestock use within allotments affected by wild horse fence construction.

Managing recreational activities under this alternative would likely reduce related impacts. Camping would be allowed only in designated areas, and parties of five or more would require a group camping permit. This would help monitor concentration of use, limit camping along streams, and reduce compaction of vegetation and soils. The amount of area closed to OHV use or restricted to designated areas would increase and thus would reduce the potential for damage to forage resources. Withdrawing the planning area from recreational mining use would eliminate related surface disturbance and forage losses. However the likelihood that this activity would disturb a significant area of available forage is negligible.

Actions related to special management areas under this alternative could have a greater effect on livestock grazing. Management actions associated with expansion of existing ACECs and historic viewsheds, and designation of new ACECs, WSAs, and research natural areas would increase the amount of area subject to surface disturbance restrictions and limitations and thus would increase protections to forage resources. However, such expansions and designations would also further limit construction of water developments and range improvements, potentially affecting livestock operations.

Cumulative Impacts. Increased restrictions on livestock grazing under this alternative likely could increase the cost of operations and possibly shorten the grazing season for some operators. Impacts could be significant in the short term if operators are forced to reduce AUMs to meet rangeland standards. These effects likely would be reduced in the long term because of improved rangeland health and increased ability to meet rangeland standards. Anticipated decreases in development could offset impacts caused by forage reduction, as compared to the No Action Alternative and Alternative 1.

4.4.4.5 Alternative 3

Effects resulting from management of heritage resources and vegetation would be the same as impacts common to all alternatives. Impacts on livestock grazing from the fire management program would be the same as those of the No Action Alternative.

Livestock grazing management actions under this alternative would affect livestock operators similar to such actions under the No Action Alternative. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would continue to be similar to historic levels and not result in any additional grazing pressure on available forage. Construction and maintenance of livestock range improvements and water developments would be designed to improve resource conditions and/or enhance livestock distribution. This would maintain healthy forage conditions and prevent overuse of vegetation resources. Prohibiting salt and mineral supplements within one-quarter-mile of riparian areas, historic trails, and special status plant species would improve livestock distribution and help ensure that water quality remains adequate. The effectiveness of the increased distance would depend on the size and type of the activity and the topography and drainage patterns of the activity location.

Watershed management actions would affect livestock grazing similar to such actions under the No Action Alternative. Surface disturbance would be limited within 500 feet to one-quarter-mile of riparian areas and other water resources and thus could adversely impact livestock grazing management by precluding the construction of water developments and range improvements in these areas. However this limitation could also conserve forage resources within these areas. Riparian exclosures could also impact grazing activities by reducing the amount of available forage for livestock, as the exclosures would be closed to grazing.

Impacts from mineral exploration and development, and from other surface disturbances in support of these activities (e.g., ROWs), would be similar to those of the No Action Alternative. The amount of surface disturbance associated with mineral development would be approximately 190 acres in the most active year and approximately 1,600 acres over the planning period (Appendix 13, Table A13-7), which would represent an insignificant impact on livestock grazing when compared to the size of the planning area. Standards for reclamation of linear surface disturbances would help mitigate any affect on livestock grazing related to vegetation removal. Effects from most mineral development would be temporary, as the vegetation conditions on most sites ultimately would be reclaimed. Effects to grazing could result if development outpaces reclamation and replacement of forage.

Management actions for wildlife would have impacts on livestock grazing similar to those of Alternative 2 but not as great. Expanded protection and enhancement measures for wildlife resources would limit surface disturbance and improve forage conditions but could also increase wildlife populations and thereby potentially reduce available forage for livestock. WGFD efforts to maintain wildlife population objectives should prevent this effect. Overall adverse impacts on livestock grazing could be slightly greater than under the No Action Alternative because it is anticipated that the elk population objective would be increased to 1,200. This would require an increase of 1,513 AUMs for elk, an insignificant increase when compared to the available forage of the total planning area. Lethal methods would be allowed for animal damage control for both livestock and wildlife protection. This could directly benefit livestock operations by removing animals known to have killed livestock.

Approximately 10,860 AUMs within the JMH planning area (see Table 4-11 at the end of Chapter 4) would be necessary to support the WGFD herd unit population objectives for elk (1,200), mule deer (4,000), antelope (6,000), and wild horses (415–600). Estimates of AUMs were based on animal unit equivalents (AUE) specified in the Draft Environmental Impact Statement for the Proposed Grazing Management Program for the Salt Wells-Pilot Butte Area, 1983.

This alternative would expand the boundaries of the Divide Basin Wild Horse HMA to include the entire JMH planning area, and would serve to better distribute wild horses, possibly reducing the competition between livestock and wild horses over forage resources. Because wild horses currently inhabit areas outside the HMA boundaries, the likelihood of reduced effects would not be realized in the short term until herd levels reach and maintain the AML.

Recreational management actions would affect livestock grazing similar to such actions under Alternative 2. Camping would be allowed only in designated areas, and parties of 10 or more would require a group camping permit. This would help monitor concentration of use, limit camping along streams, and reduce compaction of vegetation and soils. Areas closed to OHV use or where OHV use is restricted to designated areas would reduce the potential for damage to forage resources. The planning area would be withdrawn from recreational mining use except for a 5-acre site that would be designated and managed for recreational mining; thus surface disturbance or loss of forage would be negligible from this type of activity.

Effects related to management actions associated with special management areas would be similar to those of Alternative 2 but not as great. Management actions associated with fewer expansions and designations of special management areas under this alternative would result in fewer actions that place limitations and restrictions on surface disturbing activities.

Cumulative Impacts. Cumulative impacts would be the same as those described in Alternative 2, except impacts would likely be less extensive because of fewer grazing restrictions. Short-term impacts could occur but are not expected to be significant.

4.4.4.6 Preferred Alternative

Management of heritage sites would generally be limited to relatively small areas. Even under the most intense management (i.e., excavation), the amount of acreage disturbed would be very small. These activities are not anticipated to have measurable impacts on livestock forage resources. Impacts could occur if heritage sites are fenced from livestock use, causing a loss of available forage. However, given the size of most heritage sites, this impact would be minimal. Other impacts may occur because of restrictions on surface disturbing activities near heritage sites, which may preclude the construction of range improvements designed to facilitate livestock grazing. Conversely, such restrictions would provide protection to vegetation resources, which in turn could maintain or enhance forage conditions. Effects on vegetation resources near the paleosol deposition area would most likely be less extensive than under the No Action Alternative because of management of this area as an archeological district. Management actions would increase protections from surface disturbing activities, thereby reducing adverse impacts to forage resources.

Both wildland and prescribed fires would have short-term impacts on livestock grazing because of a loss of forage resources. However, over the long term, fire has the potential to improve forage production capacity and convert shrub habitat to grasslands. This would

benefit livestock by providing increased levels of preferred forage. The requirement to rest a burn area to allow new vegetation to establish could have a short-term impact on livestock grazing, as the amount of available forage would be reduced for the localized area of the burn. The level of significance of this effect would depend on the extent of the burn area and season of use. Full fire suppression for basin big sagebrush/lemon scurfpea vegetation associations could also result in short-term impacts on livestock grazing through loss of plant diversity. This vegetation association stabilizes the sandy soils in this area of JMH and provides habitat and forage primarily for wildlife. Due to the relatively limited extent of these vegetation associations, impacts on livestock grazing would not be significant.

Implementation of livestock grazing management actions could have both beneficial and adverse impacts on livestock operators. Most impacts would occur from adjustments for the purposes of complying with healthy rangeland standards. Such adjustments could include modified turnout dates, shorter grazing periods, growing season rest, riparian exclosures, forage utilization levels, and livestock conversions. While these adjustments would benefit long-term forage production and subsequently livestock growth rates, adverse impacts on livestock operators could occur in the short term. The extent of any impact on livestock grazing operations would depend on the flexibility of the individual operator to implement and respond to these adjustments.

Livestock water developments would provide additional watering sites, improving livestock distribution, and reducing competition with other grazers. Requiring that livestock range improvements and water developments improve resource conditions and/or enhance livestock distribution could require additional planning when constructing such developments, but would improve long-term forage production and prevent overuse of vegetation resources. Within sensitive wildlife habitat, livestock water developments would only be allowed if resource conditions were improved. This could further improve construction planning of such developments. Salt and mineral placement (prohibited within 500 feet of riparian habitat, historic trails and special status species habitat) could require additional planning and effort, but would distribute forage use and reduce adverse impacts to rangeland resources. Livestock grazing management could also benefit from distribution of livestock and the maintenance or improvement of vegetation. This would help achieve healthy rangelands.

Watershed management would enhance vegetation resources by reducing erosion and improving water quality. Requiring PFC as the minimum acceptable level of ecological condition for riparian areas would maintain and improve the health of riparian vegetation, which would have the indirect effect of increasing forage levels for livestock. Surface disturbance would be limited within 500 feet of riparian areas and other water resources, thereby conserving forage resources within these areas. However, this could also preclude the construction of water developments and range improvements in these areas unless any water quality impacts could be mitigated. Riparian exclosures could also adversely affect grazing activities by reducing the amount of available forage for livestock because the exclosures would be closed to grazing. However, the provision under this alternative that allows exclosures to be removed could partially offset these effects. The extent of this effect on livestock operators would depend on the number, location and size of exclosures at any given time during the planning period.

Surface disturbing activities associated with the construction of linear ROWs for pipelines, transmission lines, communication lines, and roads and oil and gas development including construction of well pads, mud pits, and roads could impact livestock grazing. Land clearing and grading activities necessary for construction removes vegetation (i.e., loss of forage

resources). Standards for reclamation of linear surface disturbances would help to mitigate potential, adverse impacts on livestock grazing due to short-term vegetation removal. Effects from most mineral development would be short-term, as the vegetation conditions on most sites are ultimately reclaimed. Salable mineral activity is not expected to have any affect on livestock grazing management because of the limited activity and limited area of vegetation removal. Any mineral withdrawals would prevent vegetation removal and a potential subsequent decrease in the forage base.

It is assumed that the amount of mineral development that could occur during the planning period would be related to available acreage. The adaptive management strategy for mineral development under this alternative would initially preclude existing oil and gas leases from being developed, potentially resulting in less impact than under the No Action Alternative. However, due to the uncertainty of the outcome of this adaptive management strategy, long-term impacts may be the same or possibly greater than under the No Action Alternative. The level of impact associated with these activities would be dependent on the amount of area ultimately developed over the planning period but is not expected to be significant as the goals and objectives for this alternative would be met through the adaptive management strategy.

Vegetation management activities would most likely result in beneficial affects on livestock grazing management. Any actions designed to enhance vegetative conditions would indirectly benefit livestock by enhancing and increasing forage production. Vegetation treatments and manipulation could cause short-term effects to livestock grazing through vegetation removal, but long-term benefits would be realized due to enhanced forage production. Preventing and controlling the spread of invasive plant species would also benefit livestock by reducing competition with native plants, consequently maintaining or improving forage production.

Activities associated with wildlife habitat management would generally benefit livestock grazing operations through habitat enhancement measures that consequently improve forage production. However, adverse effects could also result due to the inherent competition between big game species and livestock over forage resources. This competition is more pronounced with elk than with antelope or mule deer because of dietary preference. Similar to livestock, elk are considered grazers that prefer grasses, while the preference for mule deer and antelope is to browse shrub species. Large concentrations of these big game animals can occur within portions of the planning area (Map 51), which may require some livestock operators to alter grazing management practices to comply with healthy rangeland standards. Uneven distribution of big game causes some grazing allotments to receive a disproportionate amount of the total wildlife grazing within the planning area, thereby putting additional strain on the forage resources within those allotments. This is especially true for allotments located either entirely or partially within the south-central portion of the planning area, including the core area, which is birthing and wintering habitat to a majority of the big game populations that inhabit the planning area. Although the population objective for elk would vary between the No Action Alternative (500) and the action alternatives (1,200), impacts on allotments located within the south-central portion of the planning area would remain approximately the same among the alternatives due to the expectation that the elk population size in this area would not change considerably. Achieving wildlife population objectives (section 4.4.6) and implementing the various management options offered to livestock operators would help to minimize effects. Further effects could occur if management actions result in increased wildlife populations, which could reduce available forage for livestock. It is unlikely that this would occur with WGFD efforts to maintain objectives. Overall adverse impacts could be

slightly greater than under the No Action Alternative, because it is anticipated that the elk population objective would be increased to 1,200. This would require an increase of 1,513 AUMs for elk, an insignificant increase when compared to the available forage of the total planning area.

Recreational activities likely would not impact livestock grazing activities other than from limited human disturbance. Some impacts may result from the temporary removal of vegetation by campers in concentrated areas, but any impact would be negligible. The use of OHVs would not impact livestock if this recreational activity stays within authorized areas. However, unauthorized OHV activity could affect livestock grazing by damaging vegetation resources and consequently reducing available forage.

Similar to those of wildlife, wild horse management activities could result in effects on livestock grazing because of competition over forage resources. However, achieving and maintaining the AML for horses, implementing monitoring and gathering plans, and allowing for water developments would all serve to limit and distribute wild horses, consequently minimizing effects on livestock grazing.

Approximately 9,346 AUMs within the JMH planning area (see Table 4-11 at the end of Chapter 4) would be necessary to support the WGFD herd unit population objectives for elk (500), mule deer (4,000), antelope (6,000), and wild horses (415–600). Estimates of AUMs were based on animal unit equivalents (AUE) specified in the Draft Environmental Impact Statement for the Proposed Grazing Management Program for the Salt Wells-Pilot Butte Area, 1983.

The protections afforded to special management areas would generally benefit livestock grazing. Protections aimed at conserving sensitive vegetation communities, and limitations on mineral development and other surface disturbing activities, would benefit livestock grazing by enhancing overall vegetation conditions and subsequently increasing forage production. These effects would most likely be greater than under the No Action Alternative because of implementation of management actions associated with additional designations of special management areas.

Cumulative Impacts. Reductions in the forage base due to development and other surface disturbing activities, combined with competition for forage resources, would result in cumulative impacts to livestock grazing. This could increase the cost of operations for some operators and possibly reduce the ability to meet the Wyoming Standards for Healthy Rangelands, which could in turn place additional restrictions on livestock grazing (possible short-term reduction in use). Impacts could occur in the short term by limiting grazing to achieve rangeland standards but would be reduced in the long term because of improved rangeland health.

Impacts due to development activity and subsequent forage loss could be reduced as compared to the No Action Alternative because of staged development activity. However, competition over forage resources with other grazing animals would increase slightly over the No Action Alternative because of further increases in wildlife objectives.

4.4.5 Impacts on Vegetation Management

Vegetation management includes all plants, the habitats they create, and watershed stability. Resources include species that are protected under the Endangered Species Act (ESA),

identified as Wyoming BLM sensitive status species, state species of concern, rare plant communities and associations, and noxious weeds. The effects that implementing vegetation management actions have on other resources and resource users are discussed in those particular resource sections. This section describes potential impact on vegetation resources due to the implementation of management actions for other resource management categories.

Effects to vegetation would be considered significant if the viability of protected plant species were jeopardized, with little likelihood of reestablishment after disturbance, or actions would result in the need to list a species under the ESA. A lesser effect would result if the disturbed population could be reestablished to its original state and condition, or the population is sufficiently large or resilient to respond to disturbance without a measurable change. The impact would be significant if reclaimed areas do not attain adequate vegetation ground cover and species composition to stabilize the site within 5 years from disturbance, or there is invasion and establishment of noxious weeds that contribute to unsuccessful revegetation. The significance of an impact is also dependent on the importance of the resource and the proportion of the resource that would be affected relative to its occurrence in the vicinity. An increase in population numbers in response to an enhanced habitat or the increased viability of a species would be viewed as beneficial impact.

For analysis purposes it is assumed that adequate vegetative ground cover and species composition for site stabilization would occur in 3 to 5 years and that brush reestablishment in disturbed areas would create a vegetative landscape similar to adjacent lands in excess of 20 years. Adequate forage is assumed available for current wildlife objective numbers, and it is assumed that all management actions associated with the protection of wildlife habitat and cultural resources have a direct benefit to vegetation management. All surface disturbing activities would require reclamation as per the Rock Springs District Reclamation Monitoring Plan, and new oil and gas leases would have stipulations for protection of threatened, endangered, and Wyoming BLM sensitive species.

4.4.5.1 Common to All Alternatives

Implementation of the Wyoming Standards for Healthy Rangelands as the minimum acceptable conditions for public rangelands would increase the health and diversity of vegetation communities. By ensuring that all activities conducted on public lands within the planning area are designed to maintain and enhance native vegetation and promote healthy watersheds, negative impacts to plants and their habitat would be minimized to an acceptable level. Monitoring and evaluation of rangeland uses and effects would occur. Results of these evaluations would determine whether the objectives of this plan are being met, and if not, then management actions would be taken to improve the conditions of native vegetation.

The potential for additional strain on forage resources exists within portions of the planning area (south-central) from potential concentrations of grazing animals. Heavy concentrations of grazing animals could result in potential impacts of overutilization to vegetation. However, monitoring and evaluation of habitat to comply with the Wyoming Standards for Healthy Rangelands would provide information on vegetation resources before impacts become significant.

Wildfires usually have more adverse impacts than prescribed burns, because wildfires generally cover larger areas and remove more vegetation, and if burning outside established prescription, they often burn with enough heat to adversely affect soil organisms as well as kill the root system of some plants. This could result in long-term adverse impacts by

compromising future plant recruitment and growth rates. Prescribed fire burning within prescription areas would generally have a long-term beneficial effect on vegetation by increasing age and species diversity of plant communities, promoting thicker vegetation growth, and enhancing nutrient cycling.

The management actions established for special management areas would generally benefit vegetation resources. Protections aimed at conserving sensitive vegetation communities, and limitations on mineral development and other surface disturbing activities, would benefit vegetation by enhancing overall conditions.

Watershed management would provide benefits to native vegetation by maintaining or restoring healthy and diverse plant communities through the establishment of DPC objectives, buffer zones placed around riparian areas, and restrictions on surface disturbance within riparian areas and floodplains. Actions that would maintain or improve watershed conditions would generally benefit vegetation communities.

Valid existing mineral rights (existing fluid mineral leases and mining claims) cover over half of the planning area and may cause adverse impacts to vegetation because of a lack of requirements for mitigation that protect vegetation resources. This has the potential for significant effects to vegetation, with the severity of the effects dependent on the amount of activity and the success of reclamation efforts for disturbed areas.

Surface disturbance associated with livestock water developments or mineral activities other than oil and gas would account for approximately 122 acres of disturbance to vegetation (oil and gas surface disturbance is detailed under each alternative discussion). This total accounts for 6 acres (worst case) disturbed during construction of livestock water developments (assuming 1 acre per development), 53 acres for mineral location (with no more than 5 acres disturbed at one time), 15 acres for solid mineral development, and 25 acres for mineral material sales.

Reclamation of surface disturbing activities would be conducted in accordance with the Wyoming Policy on Reclamation (IM No. WY-90-231) and the Rock Springs District Reclamation Program. Achievement of the revegetation objectives under reclamation would replace native plant communities in the long term, providing healthy habitat for colonization and expansion of special status plant species. Monitoring of disturbed sites would enhance reclamation success. Containerized shrub seedlings used in reclamation practices would help reestablish shrubs in sensitive areas, decreasing adverse impacts in the short term. Significant impacts could occur if adequate revegetation measures are not implemented and monitored to insure successful revegetation.

4.4.5.2 No Action Alternative

The management of heritage sites would indirectly benefit vegetation through preservation of possible rare and sensitive plant communities as well as general vegetation characteristics, but any impact would generally be limited to relatively small areas. Even under the most intense management (i.e., excavation), the amount of vegetation disturbed would be very small.

Both wildland and prescribed fires could have short-term localized impacts on vegetation, however the long-term effect of fire would be improved forage production capacity and the conversion of shrub habitat to grasslands. Prescribed burning, the preferred method of

vegetation treatment, would cause a long-term decrease in sagebrush species, a short-term increase in annual weeds, and a long-term increase in grass species. Vegetative cover would be reduced during the first two growing seasons but would likely improve in the third year following a prescribed burn resulting in beneficial effects. Approximately 5,000 acres within the planning area are proposed for prescribed burns during the planning period.

Wildfires cause a short-term loss of vegetation and livestock/wildlife forage on rangelands. Wildfires usually occur in the high-density sagebrush, juniper, conifer, and aspen communities. Within 3 years, livestock and wildlife forage would generally exceed original levels in some vegetation types, as grasses and forbs replace shrubs. The surface disturbance associated with fire line construction, the use of heavy equipment, and other fire suppression activity often damages or destroys vegetation and accelerates natural soil erosion. Fire suppression activities within special status plant species habitat would be limited to existing roads and trails to prevent any further impact to these species from crushing or removal.

Fire within the basin big sagebrush/lemon scurfpea community would be adverse because of the unlikely reestablishment of this association within a few years after a fire. Additional prescriptions for managing fire would include full suppression in the basin big sagebrush/lemon scurfpea plant community, providing protection for this unique vegetation association that stabilizes the sandy soils in this area of JM and provides habitat and forage primarily for wildlife.

Recreational management actions could have localized impacts on vegetation primarily from unauthorized OHV use. The greatest loss of vegetation associated with OHV use would result from unauthorized use of previously undisturbed areas. All vegetation classifications could be damaged by unauthorized OHV use, but such damage would be most common on badlands, low-density sagebrush, juniper, saltbush, and sand dune vegetation communities. A long-term loss of native vegetation due to weed invasions would also be expected with OHV use. However these effects are anticipated to be localized.

Recreational activities such as camping and recreational mining could also damage vegetation through concentrated use, trampling, and digging. Camping would be allowed within 200 feet of water sources except in areas where it would be necessary to protect water quality and wildlife and livestock watering areas. Should resource damage occur, those areas would be closed to camping to minimize long-term adverse impacts. Adverse effects of recreational mining would be minimal because of the small amount of area disturbed.

Recreation events such as OHV rallies could damage or totally remove vegetation from portions of the event route. Special recreation use permits for such events would require timing and avoidance of key areas and reclamation of the disturbed area to minimize adverse impacts on vegetation resources.

The vegetation communities likely affected by livestock grazing would include the saltbush, low-density sagebrush, high-density sagebrush, aspen, riparian, and grassland communities. Livestock allotment management plans (AMPs), or other activity plans intended to serve as the functional equivalent of an AMP, would address achieving DPC objectives, thereby minimizing impacts on uplands and riparian areas.

Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would be similar to historic levels, thus direct impacts on vegetation would likely be comparable to current conditions. Some localized overuse of forage would

continue, primarily in riparian zones and around watering holes and dunal ponds. When forage is overused, plants cannot provide for their own growth, maintenance, and reproduction, and are eventually replaced by less desirable species that produce little or no forage value. Implementation of healthy rangeland standards and guidelines for livestock grazing would ensure the viability of vegetation resources.

Water developments would affect vegetation. Areas around existing water sources receive more use than the adjacent uplands, with increased bare ground, weed invasion, and soil erosion. This would continue in the long term as new waters are developed.

Fencing would be used to manage livestock grazing to improve forage and habitat condition on upland and wetland sites. Range condition should improve on localized areas where fences are used to implement grazing management plans or better distribute livestock. More diverse vegetation would be produced, and soil erosion would be reduced. Herding control would be encouraged as an alternative to fencing, which could also provide benefits to vegetation.

Season-long grazing use of range grasses has significant adverse impacts on their physiological health. Grasses that are grazed too long, too closely, or too frequently at the same stage of growth display marked reductions in vigor and health, becoming more susceptible to drought, injury, and lower production. Decline in soil condition, plant cover, and species composition encourage the invasion and growth of noxious weeds. Early spring grazing would also have adverse impact on range grass and forb species by the trampling of wet soils, uprooting seedlings, and mechanical injury to both mature plants and new seedlings. This adverse impact would be recognized in AMPs, or other activity plans intended to serve as the functional equivalent of an AMP, and would be minimized through implementation of healthy rangeland standards and guidelines.

Watershed management would provide benefits to native vegetation by maintaining or restoring healthy and diverse plant communities through the establishment of DPC objectives, buffer zones placed around riparian areas, and restrictions on surface disturbance within riparian areas and floodplains. Actions that would maintain or improve watershed conditions would generally benefit vegetation communities.

Surface disturbing activities associated with the construction of linear ROWs for pipelines, transmission lines, communication lines, and roads; and oil and gas development including construction of well pads, mud pits, and roads, could adversely impact vegetation resources. Land clearing and grading activities necessary for construction remove vegetation and compact soils, which contributes to noxious weeds. The amount of surface disturbance associated with fluid mineral development would be approximately 200 acres in the most active year and approximately 1,800 acres over the planning period (Appendix 13, Table A13-7), representing an insignificant impact on vegetation when compared to the size of the planning area. This impact could be significant if the amount of vegetation lost is of a type that is not abundant within the planning area. Loss of vegetation could be short-term or long-term depending on the success of reclamation efforts for disturbed areas. However if reclamation would be successful, some original plant communities, particularly shrub communities and stabilized sand dunes, would not likely be reestablished to the same structure and density of predisturbance conditions for more than 20 years. The basin big sagebrush/lemon scurfpea community would likely take up to 70 years to reach the structure and density of predisturbance conditions. Some of these communities would be provided protection by controlling surface use or by no surface occupancy requirements, preserving the

character of vegetation communities. Disturbed sites would be monitored for effective reclamation, and linear ROWs would avoid sensitive status species locations. Effects from most mineral development would be temporary, as the vegetation conditions on most sites are ultimately reclaimed. An adverse impact on vegetation could result if development outpaces reclamation and reestablishment of vegetation.

Constructing wells or access roads in stabilized dunes would cause direct loss of anchoring vegetation, creating active dunes that may not stabilize with natural vegetation within the planning period (20 years). One such stabilized dune community, the basin big sagebrush/lemon scurfpea association, is not known to exist elsewhere in the country to the quantity and extent it does in the planning area. Disturbance of this plant community would likely result in the long-term loss of this unique vegetation type for the life of this plan and would therefore result in a significant impact.

A large portion of the planning area would be withdrawn from locatable mineral exploration, development, and mineral material sales. Approximately half the known unique plant communities of basin big sagebrush/lemon scurfpea and aspen would be protected from locatable mineral activity through the withdrawal of the Greater Sand Dunes ACEC and South Pass Summit. These areas would be closed to mineral material sales through the closure of the Greater Sand Dunes ACEC, Steamboat Mountain ACEC, and the Sand Dunes WSA. Some of the rare aspen communities would also be closed to mineral material sales through the closure of South Pass Summit. The areas subject to mineral activity could result in direct removal of shrubs and trees, causing adverse long-term effects to these communities through conversion to grassland and nonwoodland-type areas. The majority of basin big sagebrush/lemon scurfpea and other mountain shrub communities would be open to coal exploration and development, which could cause adverse long-term effects because of direct removal of these communities and long-term reclamation periods. However, it would be unlikely that any development would take place during the planning period because of projected demand.

Noxious weeds are expected to increase under this alternative as a result of surface disturbing activities. Weeds have direct adverse impacts to native vegetation that, once established, are extremely costly and time consuming to control and even harder to eradicate. Vehicles, horses, wildlife, livestock, campers and hikers, and just about any other mobile conveyance would spread weed seeds from their source into disturbed areas. Most adverse impacts due to noxious weeds are expected to occur adjacent to roads, as they have the highest use of traffic to and from the planning area.

One of the two federally listed plant species potentially occurring within the planning area, the Ute ladies'-tresses, may be affected by management actions but would likely not be adversely affected. Plant species may be affected because of the amount of surface disturbance associated with management of the planning area, however no adverse effects would occur because of required surveys for threatened and endangered species prior to surface disturbance activities and subsequent protection measures developed by BLM in conjunction with the U.S. Fish and Wildlife Service (FWS) should a species be found. There would be no effect to the blowout penstemon from management of the planning area because of the unlikely occurrence of the plant in the planning area.

Potential habitats of Wyoming BLM sensitive species would require searches for the species prior to approval of any project or activity. Known locations of these communities would be protected and closed or withdrawn from OHV use, surface disturbance and disruptive

activities, locatable mineral development, mineral material sales, and coal and sodium exploration. Special status plant species would also be avoidance areas for ROWs. These requirements would reduce adverse impacts to special status plant species communities, however existing fluid mineral leases do not contain lease stipulations protecting these species, therefore it is likely that overall adverse effects could occur if habitat is disturbed during development.

Cumulative Impacts. Cumulative effects to vegetation would result from mineral development, livestock grazing, and other surface disturbing activities but would depend on the amount and timing of activities and whether the amount of activity in the planning area outpaces the success of reclamation efforts in disturbed areas. Impacts are not likely to be significant because of the varied spacing of activities, however they are likely to be long-term, even with successful reclamation, because some native shrub plant communities require 20 to 30 years to reestablish to pre-disturbance conditions. Restrictions on surface use, implementation of healthy rangeland standards and desired plant community objectives, and monitoring efforts would provide protection to vegetation resources and help reduce cumulative impacts. Additional protection would be given to special status plants under the ESA and BLM Sensitive Species guidance, which would further reduce potential cumulative impacts.

4.4.5.3 Alternative 1

Impacts resulting from management of heritage resources, the fire program, and vegetation resources would be the same as impacts common to all alternatives and similar to the No Action Alternative.

The effects of OHV use and other recreational activities would be greater and occur over more of the area under this alternative than the No Action Alternative because of fewer restrictions on use in the planning area and increased development that would allow for increased access. More area of OHV use would be limited to existing roads and trails than limited to designated roads and trails (Map 19), and more roads would be developed that would allow for increased vehicle and associated human activity.

Livestock grazing management actions under this alternative could have greater adverse impacts on vegetation resources than other alternatives. The anticipated use of livestock AUMs would increase over the planning period to the permitted active use amount, which is approximately double the historic use. Together with forage utilization by big game species, this would further increase grazing pressure on vegetation resources, potentially having an adverse impact if the long-term productivity of the range is compromised. This additional impact would be realized only on allotments that are not currently close to using their fully permitted AUMs. Riparian exclosures would be removed and the area made available to livestock grazing. New exclosures would not be considered unless they benefit commodity uses. This has the potential to adversely effect vegetation through overuse of particular areas. Less restrictive measures for range improvements, water developments, and salt and mineral placement could limit protections on vegetation resources. Full implementation of these management actions could cause some difficulty in allotments meeting healthy rangeland standards.

The effects of watershed management actions would be the same as those of the No Action Alternative, except these beneficial impacts would be greatly reduced because of fewer

restrictions on surface disturbing activities and smaller buffer zones around riparian areas and floodplains.

The effects of surface disturbing activities on vegetation resources for development and ROWs are expected to be similar to those of the No Action Alternative, however adverse impacts would likely be greater because of increased development and decreased restrictions. More areas would be disturbed. Effects to sensitive plant communities would be reduced only by the designation of the Greater Sand Dunes ACEC as an avoidance area (Map 16).

The planning area would be open for new development. The amount of surface disturbance associated with fluid mineral development would be approximately 220 acres in the most active year and approximately 2,100 acres over the planning period (Appendix 13, Table A13-7), which represents an insignificant impact on vegetation when compared to the size of the planning area. This impact could be significant if the amount of vegetation lost is of a type that is not abundant within the planning area. The impacts on vegetation would be similar to those of the No Action Alternative. A significant adverse impact on vegetation could result if development outpaces reclamation and reestablishment of vegetation.

A large portion of the planning area would be open to locatable mineral exploration and development (Map 23) and mineral material sales (Map 24). Adverse effects to all vegetation communities are expected to be much greater than under the No Action Alternative because of the increased amount of area available to development. The majority of basin big sagebrush/lemon scurfpea and other mountain shrub communities would be open to coal exploration and development, similar to the No Action Alternative, however it would be unlikely that any development would take place during the planning period because of projected demand.

Management activities related to special management areas could reduce beneficial impacts to vegetation resources compared to the No Action Alternative by eliminating certain management actions in the Steamboat Mountain ACEC, by the removal of the ACEC designation for Steamboat Mountain, and by the reduction of the viewshed associated with the National Historic Trail Special Recreation Management Area through South Pass. The vegetation communities in the Steamboat Mountain area would be the most affected. This would allow more surface disturbance, potentially reducing benefits on vegetation resources.

Potential habitats of BLM sensitive species would require searches for the species before approval of any project or activity, similar to the No Action Alternative. Known locations of these communities would be protected and closed or withdrawn from OHV use, locatable mineral development, mineral material sales, and ROWs. New leases would contain stipulations that protect these communities. Overall, adverse effects to special status plant species could be significant because of the lack of protection of these communities from fluid mineral activities, geophysical exploration, and coal and sodium exploration.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except that impacts would be greatest under this alternative because of anticipated increases in development activity and livestock grazing and decreased restrictions on surface disturbance. Impacts are likely to be significant if activities occur in sensitive plant communities.

4.4.5.4 Alternative 2

Impacts resulting from management of heritage resources would be the same as those of the No Action Alternative.

Vegetation treatments including prescribed burns would be limited to noxious weed control. The benefits associated with improved forage production capacity and the conversion of shrub habitat to grasslands through prescribed burns or other treatments would not occur under this alternative. Natural succession would be allowed. Limited fire suppression for basin big sagebrush/lemon scurfpea vegetation associations would be applied, but this could have an adverse effect on vegetation. This vegetation association stabilizes the sandy soils in this area of JMH, and the reestablishment of the association in these soil conditions within a few years after a fire would be unlikely.

The adverse effects of OHV use and other recreational activities would be less under this alternative than under the No Action Alternative because of increased restrictions on use in the planning area and decreased development, which would decrease access. More of the planning area would be closed or restricted to OHV use, thus reducing access to a large portion of the planning area (Map 30). Camping in groups of five or more would be monitored and only allowed in designated areas, decreasing adverse effects to rare and sensitive plant communities and riparian areas.

The increased restrictions placed on livestock grazing activities under this alternative would likely have beneficial impacts on vegetation resources. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would be similar to historic levels. Using modified turnout dates as the primary method for meeting the Wyoming Standards for Healthy Rangelands could have beneficial effects to vegetation resources by reducing grazing pressures. Increasing the buffer area for salt and mineral placement to one-half-mile from special status plant species would require more planning and effort on the part of livestock operators and possibly increase related costs. Whether the greater distance from these areas provides any further protection to vegetation than some shorter distance could depend on the topography, drainage patterns, and the amount of vegetative cover at a particular location. Riparian exclosures and water developments would be allowed if they preserve sensitive resources or improve habitat and resource conditions, having a beneficial impact on vegetation resources.

The effects of watershed management actions would be the same as those under the No Action Alternative, except that these beneficial impacts would be greatest under this alternative because of increased restrictions on surface disturbing activities and larger buffer zones around riparian areas and floodplains.

This alternative provides the least opportunity for mineral exploration and development, which would minimize related losses of vegetation. The effects of surface disturbing activities for development and ROWs are expected to be much less than under the No Action Alternative because of increased restrictions (controlled surface use or no surface occupancy requirements) and decreased development. The amount of surface disturbance associated with mineral development would be approximately 170 acres in the most active year and approximately 1,300 acres over the planning period (Appendix 13, Table A13-7), which could represent an insignificant impact on vegetation when compared to the size of the planning area, depending on the vegetation type affected. Adverse impacts on sensitive plant communities would be reduced by the designation of the Greater Sand Dunes ACEC, the

connectivity area, and Steamboat Mountain ACEC as avoidance areas (Map 28). Other areas important to rare and sensitive plant communities would be ROW exclusion areas and include the WSAs and the paleosol deposition area. Effects from most mineral development would be temporary, as the vegetation conditions on most sites are ultimately reclaimed. However an adverse impact on vegetation could result if development outpaces reclamation and replacement of forage, or the amount of a particular type of vegetation is small in comparison to other vegetation in the planning area.

There would be little to no effects from new locatable mineral development, mineral material sales, coal leasing, or coal and sodium exploration on vegetation, because the entire planning area would be withdrawn or closed from these activities.

Development of a transportation plan specific to the planning area would further reduce adverse impacts to vegetation from ROWs, roads, OHV use, and general access. This plan would provide for appropriate access routes that enable maximum protection to rare plant communities and sensitive resources.

Adverse impacts of noxious weed infestations on vegetation resources would be less than under the No Action Alternative because of an anticipated decrease in access and activity that would introduce or aid in spreading the species in the planning area.

Actions related to special management areas could have a greater beneficial impact on vegetation resources under this alternative. Management actions associated with the addition of the paleosol deposition area to the Greater Sand Dunes ACEC and Indian Gap, the face of Steamboat Mountain, and the area where elk crucial habitat and birthing areas overlap to Steamboat Mountain ACEC, would benefit rare and sensitive plant communities through further restrictions on activities within these sensitive areas (Map 37). Management actions associated with designating special status plant species habitat and the cushion plant community as ACECs, and designation of the New Pinnacles WSA, would also benefit and protect these communities from disturbance.

Management actions associated with designation of the cushion plant community, the flockets area within the WSA portion of the Greater Sand Dunes ACEC, and a portion of the basin big sagebrush/lemon scurfpea association as Research Natural Areas would further benefit these plant communities.

Potential habitats of Wyoming BLM sensitive species would require searches for the species prior to approval of any project or activity. Known locations of these communities would be designated as an ACEC, with measures providing additional protection. Known locations would also be protected and closed to OHV use, ROWs, surface disturbance, locatable mineral development, mineral material sales, coal and sodium exploration, and geophysical exploration. Effects of existing fluid mineral leases would be the same as those described in the No Action Alternative, however new leases would contain stipulations that protect these communities. Overall, impacts to special status plant species could occur on existing leases, but these should be reduced somewhat through application of conditions of approval designed to meet the Rangeland Standards.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts would be least extensive under this alternative because of anticipated decreases in development activity and livestock grazing and increased restrictions on surface disturbance.

4.4.5.5 Alternative 3

Impacts of weed infestations from surface disturbing activities and impacts resulting from management of heritage resources would be the same as those common to all alternatives, and similar to the No Action Alternative.

Areas impacted by prescribed burns or wildland fires would be rested for 24 months after treatment to allow the vegetation to adequately reestablish before being grazed. Full fire suppression in the basin big sagebrush/lemon scurfpea plant community would be applied to provide protection for this unique vegetation association. This vegetation association stabilizes the sandy soils in this area of JMH. Reestablishment of this association in these soil conditions within a few years after a fire would be unlikely.

Any adverse effects of OHV use and other recreational activities would be slightly less under this alternative than under the No Action Alternative because of restrictions on additional areas designated as ACECs and WSAs. More area of OHV use would be limited to designated roads and trails, further reducing access to portions of the planning area (Map 41). Camping would be allowed only in designated areas, decreasing adverse effects to rare and sensitive plant communities and riparian areas. Recreation mining would be limited to a 5-acre site, and a recreation site plan would be prepared and implemented to manage the site for recreational purposes.

Livestock grazing management action under this alternative would have impacts on vegetation similar to those of the No Action Alternative. Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would continue to be similar to historic levels and not result in any additional grazing pressure on available forage. Construction and maintenance of livestock range improvements and water developments would be to improve resource conditions and/or enhance livestock distribution. This would maintain healthy forage conditions and prevent overuse of vegetation resources. Prohibiting salt and mineral supplements within one-quarter-mile of special status plant species would ensure that these species would not be adversely impacted.

The effects of watershed management actions would be the same as under the No Action Alternative, except that these beneficial impacts could be greater because of increased restrictions on surface disturbing activities and larger buffer zones around riparian areas and floodplains.

The adverse impacts related to surface disturbing activities are expected to be slightly less than those described under the No Action Alternative because of additional controlled surface use requirements (Map 39) and management actions associated with ACECs and WSAs. Adverse impacts to sensitive plant communities would be reduced by the designation of the Greater Sand Dunes ACEC as an avoidance area and the WSAs and southern portion of Steamboat Mountain as exclusion areas.

The entire planning area would be open for consideration for fluid mineral leases. Impacts on vegetation from mineral exploration and development and other surface disturbances in support of these activities (i.e., ROWs) would be similar to those of the No Action Alternative, however an adaptive management strategy would be implemented under this alternative which would establish indicators to inform BLM of adverse effects of actions within the planning area and prevent them from becoming significant through BLM's ability to control timing of development activities.

The amount of surface disturbance associated with mineral development would be approximately 190 acres in the most active year and approximately 1,600 acres over the planning period (Appendix 13, Table A13-7), which would represent an insignificant impact on vegetation when compared to the size of the planning area. The level of impact to vegetation types would depend on the location of the development and the vegetation type affected. Standards for reclamation of linear surface disturbances mitigate any potential impact to vegetation removal. Effects from most mineral development would be temporary, as the vegetation conditions on most sites are ultimately reclaimed. An adverse impact on vegetation could result if development outpaces reclamation and replacement of forage.

Development of a transportation plan specific to the planning area would further reduce adverse impacts to vegetation from ROWs, roads, OHV use, and general access. This plan would provide for appropriate access routes that enable maximum protection of rare plant communities and sensitive resources.

A large portion of the planning area would be open to locatable mineral activity (Map 45). Adverse effects to all vegetation communities would be much greater than under the No Action Alternative because of the increased amount of area available to development.

A portion of the rare plant community of basin big sagebrush/lemon scurfpea would be closed to mineral material sales through the closure of the Greater Sand Dunes ACEC and the Sand Dunes WSA (Map 46), however adverse effects would occur on the remainder of the community. Some of the rare aspen communities would also be closed to mineral material sales through the closure of South Pass Summit. Any impact to these communities would likely be significant because of the species' limited ability to reestablish after disturbance.

The unique cushion plant community would be closed to coal and sodium exploration (Map 43), but the majority of basin big sagebrush/lemon scurfpea and other mountain shrub communities would be open. Although any development could have adverse impacts to these vegetative communities, any impact likely would not be significant because the demand for this resource in this particular area is negligible.

Management actions associated with the expansion of ACECs, the paleosol deposition area to the Greater Sand Dunes ACEC and Indian Gap and the face of Steamboat Mountain to Steamboat Mountain ACEC, would benefit rare and sensitive plant communities through further restrictions on activities within these sensitive areas (Map 48). Management actions associated with designating special status plant species habitat and the cushion plant community as ACECs, and designation of the New Pinnacles WSA, would also benefit and protect these communities.

Potential habitats of Wyoming BLM sensitive species would require searches for the species prior to approval of any project or activity. Known locations would be protected and closed or withdrawn from OHV use, ROWs, surface disturbance, locatable mineral development, mineral material sales, coal and sodium exploration, and geophysical exploration. Effects of existing fluid mineral leases would be the same as those described in the No Action Alternative, however new leases would contain stipulations that protect Wyoming BLM sensitive species' communities. Overall, adverse effects to special status plant species could be high depending on the extent and location of the disturbance because of the lack of protection of these communities from existing fluid mineral leases.

Cumulative Impacts. Cumulative impacts would be the same as those described in the No Action Alternative, except impacts would be less extensive because of anticipated decreases in development activity and livestock grazing, increased restrictions on surface disturbance, and implementation of adaptive management strategies.

4.4.5.6 Preferred Alternative

Implementation of the Wyoming Standards for Healthy Rangelands as the minimum acceptable conditions for public rangelands would increase the health and diversity of planning area vegetation communities. By ensuring that all activities conducted on public lands within the planning area are designed to maintain and enhance native vegetation and promote healthy watersheds, negative impacts to plants and their habitat would be minimized to an acceptable level. Monitoring and evaluation of rangeland uses and effects would occur. Results of these evaluations would determine whether the objectives of this plan are being met, and if not, then management actions would be taken to improve the conditions of native vegetation.

The potential for additional strain on forage resources exists within portions of the planning area (south-central) from potential concentrations of grazing animals. Heavy concentrations of grazing animals could result in potential impacts of overutilization to vegetation. However, monitoring and evaluation of habitat to comply with the Wyoming Standards for Healthy Rangelands would provide information on vegetation resources before impacts become significant.

Wildfires usually have more adverse impacts than prescribed burns because wildfires generally cover larger areas and remove more vegetation, and if burning outside established prescription, they often burn with enough heat to adversely affect soil organisms as well as kill the root system of some plants. This could result in long-term adverse impacts by compromising future plant recruitment and growth rates. Prescribed fire burning within prescription areas would generally have a long-term beneficial effect on vegetation by increasing age and species diversity of plant communities, promoting thicker vegetation growth, and enhancing nutrient cycling.

The management actions established for special management areas would generally benefit vegetation resources. Protections aimed at conserving sensitive vegetation communities, and limitations on mineral development and other surface disturbing activities, would benefit vegetation by enhancing overall conditions. The addition of the West Sand Dunes Archeological District would likely reduce adverse effects on vegetation through management prescriptions that limit surface disturbing and disruptive activities within special management areas.

Watershed management would provide benefits to native vegetation by maintaining or restoring healthy and diverse plant communities through the establishment of DPC objectives, buffer zones placed around riparian areas, and restrictions on surface disturbance within riparian areas and floodplains. Actions that would maintain or improve watershed conditions would generally benefit vegetation communities.

Reclamation of surface disturbing activities would be conducted in accordance with the Wyoming Policy on Reclamation (IM No. WY-90-231) and the Rock Springs District Reclamation Program. Achievement of the revegetation objectives under reclamation would replace native plant communities in the long term, providing healthy habitat for colonization

and expansion of special status plant species. Monitoring of disturbed sites would enhance reclamation success. Containerized shrub seedlings used in reclamation practices would help reestablish shrubs in sensitive areas, decreasing adverse impacts in the short term.

The management of heritage sites would indirectly benefit vegetation through preservation of possible rare and sensitive plant communities as well as general vegetation characteristics, but any impact generally would be limited to relatively small areas. Even under the most intense management (i.e., excavation), the amount of vegetation disturbed would be very small.

Both wildland and prescribed fires could have short-term localized impacts on vegetation, however the long-term effect of fire would be improved forage production capacity and the conversion of shrub habitat to grasslands. Prescribed burning, the preferred method of vegetation treatment, would cause a long-term decrease in sagebrush species, a short-term increase in annual weeds, and a long-term increase in grass species. Vegetative cover would be reduced during the first two growing seasons but would likely improve in the third year following a prescribed burn, resulting in beneficial effects. Approximately 5,000 acres within the planning area are proposed for prescribed burns during the planning period.

Wildfires cause a short-term loss of vegetation and livestock/wildlife forage. Wildfires usually occur in the high-density sagebrush, juniper, conifer, and aspen communities. Within 3 years, livestock and wildlife forage would generally exceed original levels in some vegetation types, as grasses and forbs replace shrubs. The surface disturbance associated with fire line construction, the use of heavy equipment, and other fire suppression activity often damages or destroys vegetation and accelerates natural soil erosion. Fire suppression activities within special status plant species habitat would be limited to existing roads and trails to prevent any further impact to these species from crushing or removal.

Fire within the basin big sagebrush/lemon scurfpea community would be adverse because of the unlikely reestablishment of this association within a few years after a fire. Additional prescriptions for managing fire would include full suppression in the basin big sagebrush/lemon scurfpea plant community, providing protection for this unique vegetation association which stabilizes the sandy soils in this area of JM and provides habitat and forage primarily for wildlife.

Recreational management actions could have localized impacts on vegetation primarily from unauthorized OHV use. The greatest loss of vegetation associated with OHV use would result from unauthorized use of previously undisturbed areas. All vegetation classifications could be damaged by unauthorized OHV use, but such damage would be most common on badlands, low-density sagebrush, juniper, saltbush, and sand dune vegetation communities. A long-term loss of native vegetation due to weed invasions would also be expected with OHV use. However, these effects are anticipated to be localized.

Recreational activities such as camping and recreational mining could also damage vegetation through concentrated use, trampling, and digging. Camping would be allowed within 200 feet of water sources except in areas where it would be necessary to protect water quality and wildlife and livestock watering areas. Should resource damage occur, these areas would be closed to camping throughout the planning area to minimize long-term adverse impacts. Adverse effects of recreational mining would be minimal because of the small amount of area disturbed.

Recreation events such as OHV rallies could damage or totally remove vegetation from portions of the event route. Special recreation use permits for such events would require timing and avoidance of key areas, and reclamation of the disturbed area, to minimize adverse impacts on vegetation resources.

The vegetation communities likely affected by livestock grazing would include the saltbush, low-density sagebrush, high-density sagebrush, aspen, riparian, and grassland communities. Livestock AMPs, or other activity plans intended to serve as the functional equivalent of an AMP, would address achieving DPC objectives, thereby minimizing impacts on uplands and riparian areas.

Although livestock operators could increase AUM use to the fully permitted amount, anticipated use of AUMs would be similar to historic levels, thus direct impacts on vegetation would likely be comparable to current conditions. Some localized overuse of forage would continue, primarily in riparian zones and around watering holes and dunal ponds. When forage is overused, plants cannot provide for their own growth, maintenance, and reproduction and are eventually replaced by less desirable species that produce little or no forage value. Implementation of healthy rangeland standards and guidelines for livestock grazing would ensure the viability of vegetation resources.

Water developments could negatively affect vegetation. Areas around existing water sources receive more use than the adjacent uplands, with increased bare ground, weed invasion, and soil erosion. This would continue in the long term as new waters are developed, however effects to certain areas of sensitive habitat would be reduced because water developments would only be considered if the resource conditions are maintained or improved.

Fencing would be used to manage livestock grazing to improve forage and habitat condition on upland and wetland sites. Range condition should improve on localized areas where fences are used to implement grazing management plans or better distribute livestock. More diverse vegetation would be produced, and soil erosion would be reduced. Herding control would be considered as an alternative to fencing, which could also provide benefits to vegetation.

Season-long grazing use of range grasses has significant adverse impacts on their physiological health. Grasses that are grazed too long, too closely, or too frequently at the same stage of growth display marked reductions in vigor and health, becoming more susceptible to drought, injury, and lower production. Decline in soil condition, plant cover, and species composition encourage the invasion and growth of noxious weeds. Early spring grazing would also have adverse impact on range grass and forb species through trampling of wet soils, uprooting seedlings, and mechanical injury to both mature plants and new seedlings. This adverse impact would be recognized in AMPs or other activity plans intended to serve as the functional equivalent of an AMP, and would be minimized through implementation of healthy rangeland standards and guidelines.

Surface disturbing activities associated with the construction of linear ROWs for pipelines, transmission lines, communication lines, and roads; and oil and gas development including construction of well pads, mud pits, and roads, could adversely impact vegetation resources. Land clearing and grading activities necessary for construction remove vegetation and compact soils, which contributes to noxious weeds. Loss of vegetation could be short-term or long-term depending on the success of reclamation efforts for disturbed areas. However, if reclamation would be successful, some original plant communities, particularly shrub

communities and stabilized sand dunes, likely would not be reestablished to the same structure and density of predisturbance conditions for more than 20 years. The basin big sagebrush/lemon scurfpea community likely would take up to 70 years to reach the structure and density of predisturbance conditions. Some of these communities would be provided protection by controlling surface use or no surface occupancy requirements, preserving the character of vegetation communities.

The amount of surface disturbance associated with mineral development would be approximately 190 acres in the most active year and approximately 1,600 acres over the planning period (Appendix 13, Table A13-7), which would represent an insignificant impact on vegetation when compared to the size of the planning area. This impact could be significant if the amount of vegetation lost is of a type that is not abundant within the planning area, however an adaptive management strategy would be implemented under this alternative which would establish indicators to inform BLM of adverse effects of actions within the planning area and prevent them from becoming significant through BLM's ability to control timing and location of development activities (Appendix 17).

Constructing wells or access roads in stabilized dunes would cause direct loss of anchoring vegetation, creating active dunes that may not stabilize with natural vegetation within the planning period (20 years). One such stabilized dune community, the basin big sagebrush/lemon scurfpea association, is not known to exist elsewhere in the country to the quantity and extent that it does in the planning area. Disturbance of this plant community would likely result in the long-term loss of this unique vegetation type for the life of this plan and would therefore result in a significant impact.

A portion of the planning area would be withdrawn from locatable mineral exploration and development (Map 53), and mineral material sales (Map 58). Approximately half the known unique plant communities of basin big sagebrush/lemon scurfpea would be protected from locatable mineral activity through the withdrawal of the Greater Sand Dunes ACEC. The larger aspen communities would also be protected by the withdrawal of South Pass Summit and the northern elk birthing areas. The basin big sagebrush/lemon scurfpea would also be closed to mineral material sales through the closure of the Greater Sand Dunes ACEC, Steamboat Mountain ACEC, and the Sand Dunes WSA. Parts of the aspen communities would also be closed to mineral material sales through the closure of South Pass Summit. Special status plant species would be withdrawn from mineral location and closed to mineral material sales. The areas subject to mineral activity could result in direct removal of shrubs and trees, causing adverse long-term effects to these communities through conversion to grassland and nonwoodland-type areas.

The majority of basin big sagebrush/lemon scurfpea and other mountain shrub communities would be open to coal exploration and development, which could cause adverse long-term effects because of direct removal of these communities and long-term reclamation periods. However it would be unlikely that any development would take place during the planning period because of projected demand.

Noxious weeds are expected to increase under this alternative as a result of surface disturbing activities. Weeds have direct adverse impacts to native vegetation that, once established, are extremely costly and time consuming to control, and even harder to eradicate. Vehicles, horses, wildlife, livestock, campers and hikers, and just about any other mobile conveyance would spread weed seeds from their source into disturbed areas. Most adverse impacts due to

noxious weeds are expected to occur adjacent to roads, as they have the highest use of traffic to and from the planning area.

There would be no anticipated effects to the threatened Ute Ladies'-Tresses or endangered blowout penstemon. Surveys would be required for threatened and endangered species prior to surface disturbance activities, as well as subsequent protection measures developed by BLM in conjunction with USFWS should a species be found.

Potential habitats of Wyoming BLM sensitive species would require searches for the species prior to approval of any project or activity. Known locations of these communities would be protected and closed or withdrawn from OHV use, locatable mineral development, mineral material sales, and coal and sodium exploration. Special status plant species would also be avoidance areas for ROWs. A portion of the habitat would be closed to surface disturbance and disruptive activities through either a closed to leasing or no surface occupancy designation. The other portion of the habitat falls under existing leases, however these leases will be held in suspension until the indicators monitored in the adaptive management strategy determine that activities can take place within special status plant species habitat. All the above requirements would reduce adverse impacts to special status plant species communities, however the existing fluid mineral leases do not contain lease stipulations protecting these species, therefore it is likely that overall adverse effects could occur if it is determined that development could continue in this area.

Cumulative Impacts. Cumulative effects to vegetation would result from mineral development, livestock grazing, and other surface disturbing activities but would depend on the amount and timing of activities and whether the amount of activity in the planning area outpaces the success of reclamation efforts in disturbed areas. Impacts are not likely to be significant because of the varied spacing of activities, however the impacts are likely to be long-term, even with successful reclamation, because some native shrub plant communities require 20 to 30 years to reestablish to predisturbance conditions. Restrictions on surface use, implementation of healthy rangeland standards and desired plant community objectives, and monitoring efforts would provide protection to vegetation resources and help reduce cumulative impacts. Additional protection would be given to special status plants under the ESA and BLM Sensitive Species guidance, which would further reduce potential cumulative impacts.

Cumulative impacts would be less extensive than under the No Action Alternative because of staged development activity and increased restrictions on surface disturbance.

4.4.6 Impacts on Wildlife

Wildlife includes all terrestrial, avian, and aquatic animals and their habitats. Resources include species that are protected under the ESA, identified as Wyoming BLM sensitive status species, and state species of concern. The impacts that implementing wildlife management actions have on other resources and resource users are discussed in those particular resource sections. This section describes potential impact on wildlife due to implementation of management actions for other resource management categories.

Impacts on wildlife would be considered significant if the viability of a federally protected species were jeopardized or actions would result in the need to list a species under the ESA. A lesser impact would result if the disturbed population could be reestablished to its original state and condition, or if the population is sufficiently large or resilient to respond to

disturbance without a measurable change. The significance of an impact is also dependent on the importance of the resource and the proportion of the resource that would be affected relative to its occurrence in the vicinity. An increase in population numbers in response to an enhanced habitat or the increased viability of a species would be viewed as beneficial impact. Impacts to wildlife would also be considered significant if BLM sensitive species or native wildlife species considered as vital, high, or moderate by the WGFD Mitigation Policy show increased mortality or decreased survival rates. The WGFD Mitigation Policy also classifies habitats as vital or high. Any loss of habitat function or habitat value in these vital, high, or BLM sensitive species habitats would also indicate significant impacts to wildlife. Long-term displacement of elk or deer from crucial habitat or birthing areas within the planning area would be considered significant.

For analysis purposes it was assumed that the WGFD herd management objective for the Steamboat elk herd unit would be increased to 1,200 elk. It is also assumed that elk populations would continue to exceed WGFD herd management objectives over the short term but would ultimately achieve such objectives over the long term because of herd maintenance efforts (i.e., populations would be declining over the planning period). Therefore the analysis of environmental impacts associated with wildlife resources is based on the WGFD herd management objective rather than the current population level.

A lack of information exists for a wide range of wildlife species, including threatened and endangered species, within the planning area. As activities within the area develop, additional information would be obtained through project-specific data gathering and monitoring. Some wildlife adaptation to activities would occur within the planning area, however this would not outweigh the effects of disturbance due to the lack of topographic escape and cover for some species. Actions implemented to improve watershed quality are assumed to be directly related to improving wildlife habitat in riparian areas.

It is also assumed that the majority of oil and gas leases contain stipulations for a minimum of seasonal protection in sensitive wildlife habitats, and new oil and gas leases would have stipulations for protection of threatened and endangered and Wyoming BLM sensitive species.

4.4.6.1 Common to All Alternatives

Two types of adverse impacts to wildlife are common to all alternatives: displacement and habitat fragmentation. However, these two adverse impacts vary in degree by alternative. Displacement from surface disturbing or disruptive activities moves animals into less desirable habitat and creates competition for available resources with other species and uses. Wildlife displacement can be either direct or indirect, depending on the amount and type of activity.

The amount of land used for road surfaces, well pads, and any recreation facilities represents a direct loss of wildlife habitat, and the actual effect from surface disturbing and disruptive activities in desert areas void of tall stands of vegetation or dramatic topographic relief is greater than the direct loss of acreage indicates. Wildlife habitat loss results from road construction and road use, facility construction and placement, pipeline construction, field facility maintenance, ROW construction, range improvement construction, and disturbance zones around these areas. All disturbed acreages would not be fully reclaimed to the same structure and density of predisturbance conditions, and portions, particularly in shrub communities and stabilized sand dunes, could remain unavailable as habitat for wildlife in

excess of 20 years. The basin big sagebrush/lemon scurfpea community habitat would likely take up to 70 years to reach the same structure and density of predisturbance conditions. Limited rainfall, poor soils, and severe winter conditions make reclamation difficult, increasing the time required to reestablish suitable vegetation to predisturbance composition and density.

Activities in this type of terrain tend to displace wildlife, particularly big game species, distances upward of 3 miles because of extended sight distances and lack of security cover in the desert-type terrain. The loss of adjacent habitats due to harassment or habitat degradation is much more subtle but has been observed and documented; however it is unknown whether these are long-term effects.

Elk have been shown to avoid disturbance upward of 1 mile from active oil and gas wells (Gussey 1986; Powell and Lindzey 2002; WGFD 2000), upward of 2.4 miles from construction of drill sites (Hayden-Wing Associates 1990), and upward of 2 miles from major roads (Powell and Lindzey 2002). Disturbance is also avoided or reduced by placing topographic visual barriers between the source of disturbance and the elk (Irwin and Gillin 1984; Ward 1986; Olson 1981; Kuck et al. 1985). This disturbance is usually temporary in nature, however, and some studies have shown that elk return to the area of disturbance once the source of disturbance and human presence is absent (Gussey 1986; WGFD 2000). In 1990 Hayden-Wing Associates found that elk returned at half the previous level. Studies particular to oil and gas activities have shown that elk tolerate operating wells and associated facilities as long as human presence is absent or cover is available in the vicinity of the well site (Gusey 1986; Beak Consultants 1979, Bennington et al. 1982; Hayden-Wing Associates 1990).

A study by Kuck et. al. in 1985 showed that persistent disturbance weakens the tendency of elk to return to the disturbed area and that selection of more marginal habitat occurs. Abandonment of the traditional calf-rearing habitat did not result in abandonment of calves or a difference in survival rates between disturbed and control groups however. The study also found that there was no data to suggest that elk habituated to mining noises. Johnson and Wollrab (1987) also found that elk distribution changed during gas exploration and field development through the abandonment of winter and calving habitat and changes in range. They discovered that although elk returned to disturbed sites, populations were lower (sometimes less than half), and use of the habitat was unpredictable.

When studying elk response to roads, Lyon and Ward (1982) found that elk moved from 0.24 to 1.8 miles, depending on the amount and type of traffic, road quality, and adjacent cover density. Generally, road avoidance has been reported to be greater in areas of open vegetation with less adjacent cover (Perry and Overly 1976; Lyon 1979), in shrub lands rather than in pine forests and juniper woodlands (Rost and Bailey 1979), and in areas with increased density of high-quality roads (Hershey and Leege 1976).

A JMH Desert Elk Study was initiated in 1999 to better understand the effects of human disturbance on elk behavior and habitat use within the planning area. Preliminary findings of this study include the following: Elk selected habitats offering security cover during calving and summer seasons, including tall sage, aspen, and mountain shrub habitat types; mountain mahogany habitats were selected during winter, and no selection was made of outcrop/badlands or dunes; elk avoided areas within 1.2 miles of active oil and gas wells and areas within 1 mile of major roads and used areas greater than 2.5 miles from active oil and gas wells and 1.9 miles from major roads; 42 percent of all elk observed within roadless areas

(WSAs) occurred during the 2-month fall hunting season; mean daily movements of treatment elk were significantly greater than those of control elk prior to and after disturbance; significantly fewer pellet groups were counted in disturbed calving areas than in those not disturbed (Powell and Lindzey 2002).

It is generally agreed that there is no way to eliminate human presence and disturbance from the area, however once disturbance reaches a certain threshold, impacts are expected to become significant. Further study and monitoring are needed to determine what the threshold is for the planning area.

Habitat fragmentation occurs when a contiguous habitat is broken up (fragmented) by disturbing activities, causing a reduction in usable ranges and the isolation of smaller, less mobile species; a loss of genetic integrity from within species or populations; and an increase in abundance of habitat generalists that are characteristic of disturbed environments (i.e., competitors, predators, and parasites) (Harris 1998). The primary factor affecting wildlife species (primarily big game) within the planning area is the reduction in usable range and disruption of migration corridors that link crucial habitat (winter range) and birthing areas. This would particularly occur in areas with many access roads and surface disturbances.

Transportation routes tend to dissect habitats and can act as barriers to some species, especially in severe winter conditions. This could also increase the accessibility to the general public into areas that previously have been somewhat inaccessible to vehicles during the winter and spring. This would become more important and increase adverse effects to wildlife as increased demands for use of public lands occur. Migration routes could be altered or eliminated, changing some traditional use patterns on a local level. Seclusion areas for wildlife would become smaller and more dispersed in some areas. Increased oil and gas activity, especially in areas with reduced well spacing (40- and 80-acre spacing), would preclude use of some of these areas by wildlife species, especially deer and elk. This could diminish the ability to maintain current population objectives for big game species.

Existing leases within the planning area may not provide the specific mitigation measures needed to protect important habitats or wildlife. Mitigating measures (conditions of approval) could be identified through environmental analysis, but depending on economics, the companies could claim an economic hardship and may not have to implement the recommended mitigation measures. Without specific mitigation, such as remote monitoring, pad drilling, directional drilling, and centralized tank batteries, the areas where activity occurs could prevent wildlife from using the area for the life of the activity. Mitigation, such as seasonal closures to protect big game birthing areas within the core and ACECs, would not apply to mineral development that needs to access the area. This has the potential to have significant effects to big game, with the severity of the effects dependent on the amount, timing, and duration of activity, however it is uncertain how big game will react to this disturbance in the planning area.

Given the specificity of Greater Sage-Grouse nesting requirements, including mature sagebrush, it would require in excess of 20 years to restore destroyed nesting habitat to pre-disturbance conditions. During this time, however, opportunities may exist to enhance remaining vegetation and habitat characteristics (for example, applying vegetation treatments to create a mosaic in the landscape) to provide more suitable habitat than currently exists. If that cannot be accomplished, there would be a net loss of habitat function, and adverse impacts to Greater Sage-Grouse nesting habitat during the planning period. Noise may adversely affect strutting and nesting grouse. The amount of impact is unknown at this time,

but scientific literature suggests that the impacts could be substantial (LaGory et al. 2001; Dantzker et al. 1999).

The health of fisheries within the planning area is directly related to the overall health and functional capabilities of riparian resources, which in turn are a reflection of watershed health. Any activities that affect the ecological condition of the watershed and its vegetative cover would directly affect the aquatic environment. It is assumed that any substantial disturbance to the soils or changes in vegetative cover have an adverse effect on watershed health and water quality and would therefore have an adverse effect on associated fisheries. The degree of impact attributed to any one disturbance or series of disturbances is influenced by location within the watershed, time and degree of disturbance, existing vegetation, and precipitation. Surface disturbances result in accelerated erosion and runoff, increasing stream flow and sediment and nutrient loads to local channels. Sedimentation of a given channel can impact fisheries by reducing habitat complexity, which results in a lower diversity of prey organisms. Increased turbidity also results from increased sediment input, which decreases light penetration and inhibits visual predation by fish. Surface disturbance near streams that results in substantial removal of riparian vegetation can increase current velocity, which puts additional strain on fish and reduces nutrient cycling. In addition to increased sediment input, stream bank disturbance can impact fisheries by creating bank instability, which can alter flow and destroy pool-riffle formations necessary for fish survival. Increased nutrient loading of streams can also impact fisheries by increasing primary production above natural levels, which degrades habitat and decreases oxygen levels. Since any impact on natural water resources is also an impact on fisheries, impacts to fisheries can be inferred from section 4.4.2, which discusses impacts on riparian areas and water quality.

The potential for additional strain on forage resources exists within portions of the planning area (south-central) from potential concentrations of grazing animals. Heavy concentrations of grazing animals could result in potential impacts of overutilization on vegetation. However, monitoring and evaluation of habitat to comply with the Wyoming Standards for Healthy Rangelands would provide information on vegetation resources before impacts become significant.

The management of heritage sites would indirectly benefit wildlife through preservation of possible habitat as well as general habitat characteristics, but any impact generally would be limited to relatively small areas. Even under the most intense management (i.e., excavation), the amount of habitat disturbed would be very small.

Watershed management would provide benefits to wildlife by maintaining or restoring habitat conditions through the establishment of DPC objectives, buffer zones placed around riparian areas, and restrictions on surface disturbance within riparian areas and floodplains. Actions that would maintain or improve watershed conditions would generally benefit the ecological condition of wildlife habitat.

The management actions afforded to special management areas would generally result in beneficial impacts on wildlife resources. Protections aimed at conserving vegetation resources, and limitations on mineral development and other surface disturbing activities, would benefit wildlife by enhancing overall habitat conditions.

4.4.6.2 No Action Alternative

Prescribed fire as a vegetation treatment in the planning area could benefit many wildlife habitats because it aids in regeneration of some tree and shrub species and allows for additional wildlife forage. An adverse effect of prescribed fire on wildlife habitat includes extensive forage utilization by big game species after treatment of aspen stands. Another possible adverse impact of prescribed fire in the planning area would be loss of cover. Conversions of shrubs to grassland using prescribed fire would attribute to a direct loss of cover for those species (such as small mammals, Greater Sage-Grouse, and big game) that require cover for security to carry out life stages. The effects of loss of cover could be long-term, particularly since sagebrush takes over 20 years to reach appropriate canopy cover height and spacing needed for some sagebrush-dependent species. Greater Sage-Grouse are particularly susceptible to loss of cover from fire activities because of the relationship between their breeding, brood-rearing, and wintering habitat and sagebrush. Significant long-term adverse impacts could occur to Greater Sage-Grouse nesting habitat and winter concentration areas if large acreages are burned. Brood-rearing habitat also may be negatively affected by prescribed burns; however, further investigation is needed. No prescribed fires would be allowed within the basin big sagebrush/lemon scurfpea vegetation association, therefore effects to wildlife dependent on this association would not occur.

Wild horses currently occur in the planning area outside the identified HMAs and are above AMLs. Both these factors compound problems associated with limited water sources and big game crucial habitat (winter range). Wild horses concentrate in the core area during the summer months and compete with big game for available forage during winter months (November through March). With livestock competition for available water and forage added to wild horse competition, adverse impacts to big game would be expected. Water developments provided on an as-needed basis would reduce this competition and therefore lessen adverse impacts to big game. All water developments within sensitive wildlife habitats would be in conformance with wildlife objectives. Adverse impacts in the planning area from wild horses would also be minimal provided numbers are kept at plan objective levels and the herd is maintained within the HMA.

Protection of special status plant species would benefit wildlife habitat through protection of plant species associated with the proposed mountain plover, as well as other wildlife species, from surface disturbing and disruptive activities. Reduction of invasive species would also benefit wildlife habitat through maintaining the quality of habitat by requiring provisions to reduce and control invasive species.

OHV use is expected to increase because of improvements in the facilities near the Greater Sand Dunes Recreation Area, increased interest in the planning area, and increased access due to development activities. Estimated amounts of recreation are discussed in detail in Section 4.7, Recreation Resources. The majority of OHV use would occur within the Greater Sand Dunes Recreation Area, however activity is also expected throughout the planning area. No significant OHV impacts to wildlife (specifically elk, mule deer, antelope, and raptors) are expected from OHV use because of the ability to place seasonal restrictions on OHV users (Map 9) at crucial times in sensitive habitats; seasonal closure of Steamboat Mountain; limitation of access to designated roads and trails in the Steamboat Mountain ACEC; and the fact that the majority of OHV use in the planning area would occur in the summer and fall (June through October), a time when wildlife would be the least sensitive to human disturbance. However the OHVs do cause localized adverse impacts to wildlife by disturbance due to human presence, and a small amount of surface disturbance. Additional

areas of seasonal restrictions could be implemented as needed to reduce adverse impacts. The exception to protection under seasonal restrictions is the Greater Sage-Grouse. Currently no seasonal protection of Greater Sage-Grouse from OHV use exists; therefore possible adverse effects could occur because of the sensitivity and character of leks (usually in areas of very sparse to no vegetation), which provide easier terrain for OHV users. These adverse impacts to Greater Sage-Grouse and other wildlife species could be minimized if users stay on existing roads and trails.

Geophysical exploration activities could have similar effects. However, effects would be reduced by seasonal restrictions and by conforming to OHV designations.

Recreation activities (camping, hiking/biking, recreational mining) in the planning area would be expected to increase steadily throughout the planning period. Impacts to wildlife from recreation activities would cause localized adverse impacts to wildlife by disturbance due to human presence, and a small amount of surface disturbance. It is unknown whether these impacts would be short- or long-term.

Hunting activity in the planning area has been shown to have short-term adverse effects on elk, and most likely all wildlife, in the planning area because of an increase in human activities and disturbance (Powell and Lindzey 2002). Hunting is expected to remain constant, and therefore the level of short-term disturbance from increased human activity would remain the same.

The effects of livestock grazing on wildlife would be minimal because actions (livestock water developments, exclosures, fencing, and conversions) taken for improving rangeland and riparian habitat must meet the Wyoming Standards for Healthy Rangelands (Appendix 10). Forage utilization levels would be evaluated on a case-by-case basis and would factor in forage for livestock, wildlife, and wild horses. Water developments could benefit wildlife by providing additional sources of water but could also adversely impact wildlife habitat, particularly in winter and birthing ranges, through possible reductions in forage due to increased distribution of animals. However, implementation of the Wyoming Standards for Healthy Rangelands would ensure that impacts would not be significant. Adverse impacts of fences on wildlife within the planning area would be minimal because of requirements that they would be located so as not to impede wildlife movement and would be removed, modified, or reconstructed where documented conflicts with wildlife occur. Future livestock conversions (sheep to cattle or vice versa) would be carefully analyzed. Sustainability reviews would be required prior to conversions, which would benefit range.

Watershed management would provide benefits to wildlife by maintaining or restoring habitat conditions through the establishment of DPC objectives, buffer zones placed around riparian areas, and restrictions on surface disturbance within riparian areas and floodplains. Actions that would maintain or improve watershed conditions would generally benefit the ecological condition of wildlife habitat.

It is estimated that 23 livestock pits, ponds, and water wells may be created or rebuilt in the planning area. Each one of these water developments is assumed to cause a depletion to the Colorado and Platte River systems. Water depletions are important, because the water from portions of the planning area is part of the habitat for endangered fish, wildlife and/or plant species downstream from the project area in the Colorado and Platte River systems. It is assumed that all water used for livestock pits, ponds, and water wells within the Green River and Sweetwater River basins would have contributed to the surface flows of the Colorado or

Platte Rivers or their tributaries. In addition, of the 23 water developments to be constructed, 19 would be in the Green River basin (Colorado River) and 4 would be in the Sweetwater River basin (Platte River). Using 5-acre-feet per water development over the 20-year planning period, average annual depletions anticipated by these actions would not exceed 4.75 acre-feet for the Colorado River system and 1 acre-foot for the Platte River system after all are installed (see the Biological Assessment [Appendix 3] for additional assumptions related to depletions from livestock water developments).

Wildlife may experience adverse impacts from development in the form of surface disturbance. Greater Sage-Grouse leks, wetlands, riparian areas, and floodplains are within the controlled surface use category which limits some surface disturbing activities within one-quarter-mile of a lek and within 500 feet of wetlands, riparian areas, or floodplains (Map 7). Raptor nesting sites are within the no surface occupancy category that limits all surface disturbance to that site and limits permanent or high-profile structures within a specified distance. Seasonal limitations for reduction of disturbance are applied for one-half- to 1-mile from the nesting site, depending on the species of raptor, within Greater Sage-Grouse winter concentration areas, and within 2 miles of Greater Sage-Grouse leks. These restrictions would reduce the adverse impacts to these species, however it is unknown to what extent adverse impact would be reduced.

ROWs (such as pipelines and power lines) could adversely effect wildlife habitat because of the disturbance of associated roads, increased access, and associated displacement caused by human presence. Many of these alternations of habitat favor predators, thereby increasing predation of species such as the Greater Sage-Grouse. Although companies may not need to travel pipeline routes, removal or crushing of vegetation allows for increased access for recreationists, causing further intrusion into wildlife habitat and increased disturbance. Currently, numerous two-track-type roads access almost all parts of the planning area, although they are used primarily seasonally during hunting. Aboveground pipelines would have less adverse impact to crucial wildlife habitats (big sagebrush, mountain shrubs, woodland habitats, stabilized sand dunes), however these pose a threat to public safety, primarily OHV users. ROW impacts to Greater Sage-Grouse leks and other sensitive wildlife habitat contained in South Pass, Greater Sand Dunes, and Steamboat Mountain ACECs would be reduced because of their designation as avoidance areas (Map 8). All other wildlife habitats are subject to ROW designation and associated impacts. Adequate mitigation (barriers, culverts, revegetation, etc.) would be implemented to reduce impacts.

Communication sites and related access, when located in crucial habitat (winter range) and birthing areas, would have significant impacts on those habitats. Access to these sites occurs year-round. Year-round access could result in plowing of roads that displaces wintering wildlife, which would add to their stress caused by winter conditions and disrupt birthing areas. Plowing of these roads also allows for more recreational traffic to use these areas year-round. Steamboat Mountain ACEC would be closed to communication sites, which would minimize adverse impacts to big game sensitive habitats in that area.

New road development increases use by recreationists and other public land users, increasing the amount of human presence and the potential for harassment of wildlife in the area. Very limited activity currently occurs in the area from November to June because of the lack of access and lack of snow removal. Closing roads during crucial winter periods would help limit disturbance to wildlife and retain a limited level of activity.

